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# Journal of the Royal Society of Arts

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DECEMBER 1959

VOL. CVIII

*TWO HUNDRED AND SIXTH SESSION 1959-60*

*PATRON: HER MAJESTY THE QUEEN*

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A list of Standing Committees for 1959-60 is published on pages 75-9 of this issue

## FORTHCOMING MEETINGS

MONDAY, 30TH NOVEMBER, at 6.45 p.m. SPECIAL MEETING. '*Faith and Fancy*' Oration by Professor R. Y. Goodden, C.B.E., Master of the Faculty of Royal Designers for Industry. (Before the Oration, the Chairman of Council will present certain of the Society's awards. See separate Notice on p. 3.)

TUESDAY, 1ST DECEMBER, at 2.30 p.m. '*Problems and Prospects of the Economic Position of Great Britain*', by C. F. Carter, M.A., Stanley Jevons Professor of Political Economy, Manchester University. Sir Philip Southwell, C.B.E., M.C., Director, Kuwait Oil Co. Ltd., in the Chair.

THURSDAY, 3RD DECEMBER, at 2.30 p.m. COMMONWEALTH SECTION. '*Indians of British Columbia*', by Mrs. Mildred Valley Thornton, of Vancouver. Sir Alfred Bossom, Bt., LL.D., F.R.I.B.A., J.P., a Vice-President of the Society, in the Chair. (This paper, which will be illustrated with Mrs. Thornton's own paintings, has been arranged particularly for younger people (aged over 15), on whose behalf Fellows are invited to apply for tickets. Tea will be served in the Library after the meeting.)

WEDNESDAY, 9TH DECEMBER, at 2.30 p.m. '*Modern Trends in Industrial Design*', by Sir Gordon Russell, C.B.E., M.C., R.D.I., Director, Council of Industrial Design. Professor R. Y. Goodden, C.B.E., Master of the Faculty of Royal Designers for Industry, in the Chair. (The first of two papers; the second will be given on 23rd March.)

WEDNESDAY, 30TH DECEMBER, at 2.30 p.m. The first of two DR. MANN JUVENILE LECTURES on '*Animal Senses and Reactions*', by J. D. Carthy, M.A., Ph.D., of Queen Mary College, University of London. (The lectures will be illustrated with lantern slides, and tea will be served in the Library afterwards. See Special Notice, concerning admission, on p. 3.)

FRIDAY, 1ST JANUARY, at 6.30 p.m. FILM EVENING. See Programme on p. 4.

WEDNESDAY, 6TH JANUARY, at 2.30 p.m. The second DR. MANN JUVENILE LECTURE on '*Animal Senses and Reactions*', by Dr. J. D. Carthy. (Admission by special ticket, as for the first Juvenile Lecture.)

WEDNESDAY, 13TH JANUARY, at 2.30 p.m. '*The Training of Staff for Foreign Posts*', by Dr. E. J. B. Postma, Rector, Netherlands College for Representation Overseas. A. R. N. Roberts, a Member of Council of the Society, in the Chair.



THURSDAY, 14TH JANUARY, at 2.30 p.m. COMMONWEALTH SECTION. *'The Preservation of Game in East Africa'*, by R. L. E. Dreschfield, C.M.G., Q.C., Chairman, Uganda National Parks Trustees. Peter Scott, C.B.E., D.S.C., in the Chair. (This paper—which will be illustrated with a film, *'Birds of East and Central Africa'*, recently made by the American ornithologist, Bayard Read—has been arranged particularly for younger people (aged over 15), on whose behalf Fellows are invited to apply for tickets. Tea will be served after the meeting.)

WEDNESDAY, 20TH JANUARY, at 2.30 p.m. *'The Function of Management in Industry and Commerce'*, by Sir Frederic Hooper, Managing Director, Schweppes Ltd. Sir Nutcombe Hume, K.C.B., M.C., Chairman, Charterhouse Investment Trust Ltd., in the Chair.

TUESDAY, 26TH JANUARY, at 2.30 p.m. COMMONWEALTH SECTION. *'Irrigation and Population in Pakistan, India and Ceylon'*, by R. Maclagan Gorrie, D.Sc., F.R.S.E. Sir Harry Lindsay, K.C.I.E., C.B.E., a Vice-President of the Society, in the Chair.

WEDNESDAY, 27TH JANUARY, at 2.30 p.m. FRED COOK MEMORIAL LECTURE. *'Four Great Representational Portrait Painters'*, by Sir Gerald Kelly, K.C.V.O., PP.R.A. Anna Zinkeisen, R.O.I., R.D.I., in the Chair.

WEDNESDAY, 3RD FEBRUARY, at 2.30 p.m. SIR WILLIAM JACKSON POPE MEMORIAL LECTURE. *'Modern Dyes'*, by Clifford Paine, B.Sc., F.R.I.C., a Director, Imperial Chemical Industries Ltd. Sir Charles Dodds, M.V.O., F.R.S., Courtauld Professor of Biochemistry, University of London, in the Chair.

*Fellows are entitled to attend any of the Society's meetings without tickets (except where otherwise stated), and may also bring two guests. When they cannot accompany their guests, Fellows may give them special passes, books of which can be obtained on application to the Secretary.*

*Official representatives of Companies in association with the Society may also attend, with one guest.*

### SPECIAL MEETING

The awards which the Chairman of Council is to present at the Special Meeting of the Society on 30th November (see page 2) are as follows:

*Diplomas of the Distinction of Royal Designer for Industry*: to Robin Day, Abram Games, F. H. K. Henrion, Hans Schleger, Hans J. Wegner, and Berthold Wolpe.

*The Benjamin Franklin Medal for 1959*: to H. G. Nelson.

*The Bicentenary Medal for 1958*: to John Gloag.

*The Bicentenary Medal for 1959*: to F. A. Mercer.

### JUVENILE LECTURES

Special tickets for the Juvenile Lectures announced on page 2 will shortly be available and will, when ready, be sent to Fellows on request as far as the accommodation of the Lecture Hall permits.

Fellows are entitled to apply for tickets admitting one adult and two children to each lecture, and should state their exact requirements within these limits when making application.

### FILM EVENING

The next Film Evening of the Session will be held at the Society's House on Friday, 1st January, at 6.30 p.m. and, as is the custom on this occasion, the films have been specially selected with a view to the possibility that Fellows may like to bring their older children. Four films will be screened:

*The Glassmakers*

*Coupe des Alpes*

*Between the Tides*

*The Story of the Motor Car Engine*

*The Glassmakers* (18 minutes) is a colour film produced by Cecil Musk for Pilkington Brothers Ltd. It describes the uses of glass and the methods of producing it, both obsolete and modern. The film received a first prize at the recent Harrogate Festival of Films in the Service of Industry.

*Coupe des Alpes* (36 minutes), also in colour, was produced by the Shell Petroleum Company and describes the 1958 Alpine Rally. Exciting action and magnificent scenery are combined in this film, which also was highly praised at Harrogate.

*Between the Tides* (22 minutes) is another excellent colour film, produced by British Transport Films. By means of superb photography it describes some of the marine life which inhabits the rocky shores of the western coasts of Great Britain. This film received one of the British Association special awards at Harrogate, and also gained the Diploma of Honour at the 1958 Moscow Conference of the International Scientific Film Association.

*The Story of the Motor Car Engine* (10 minutes) is a colour cartoon produced by Industrial Animation Films for the Ford Motor Company. It very simply describes the development and working of a four-cylinder engine.

On this occasion light refreshments will be served in the Library *before* the performance, from 5.45 p.m. Tickets of admission are not required, and Fellows are entitled to introduce two guests.

### PRESS RECEPTION

On Wednesday, 4th November, before the Inaugural Meeting of the Session, representatives of the national and specialist Press were invited to the Society's House to meet the Chairman and Members of the Council and to view the enlarged premises; they were enabled also to see the pictures in the Lecture Hall, which have recently been cleaned. A buffet luncheon was served, and the Chairman spoke informally about the work of the Society and plans for the Session just beginning. Those present then made a tour of the Society's House and whole premises.

*INDUSTRIAL ART BURSARIES EXHIBITION*

The Exhibition of winning and commended designs in the 1958 Industrial Art Bursaries Competition will be shown at the Birmingham College of Art and Crafts, Margaret Street, Birmingham 3, from 30th November until 16th December.

*THE SOCIETY'S CHRISTMAS CARD*

The order form for the 1959 Christmas card included at the back of this *Journal* is the last which will be published this year. Those Fellows who intend to order the card are therefore asked to do so as soon as they can.

*JOURNAL INDEX AND BINDING CASES*

The index and title-page for Volume 107 of the *Journal* are in preparation and will shortly be available, without charge, to Fellows who ask for them. Orders for binding cases (with which copies of the index and title-page are supplied as a matter of course), price 7s. each, should be sent to P. G. Chapman & Co., Ltd., Kent House Lane, Beckenham, Kent, who will also undertake the work of binding at an additional cost

*MEETING OF COUNCIL*

A meeting of Council was held on Monday, 9th November, 1959. Present: Mr. Oswald P. Milne (in the Chair); Mrs. Mary Adams; Sir Hilary Blood; Sir Alfred Bossom; The Honble. G. C. H. Chubb; Sir Edward Crowe; Mr. R. E. Dangerfield; Sir George Edwards; Mr. P. A. Le Neve Foster; Sir Ernest Goodale; Professor R. Y. Goodden; Dr. Stanley Gooding; Mr. Milner Gray; Dr. R. W. Holland; Lord Latham; Mr. E. E. Lawley; Sir Harry Lindsay; Mr. F. A. Mercer; Lord Nathan; Sir Gilbert Rennie; Mr. A. R. N. Roberts; Professor S. Tolansky; Mr. G. E. Tonge and Mr. C. M. Vignoles; with Dr. K. W. Luckhurst (Secretary), Mr. G. E. Mercer (Deputy Secretary) and Mr. J. S. Skidmore (Assistant Secretary).

*ELECTIONS*

The following candidates were duly elected Fellows of the Society:

Adams, Bruce Neville, N.D.D., Shipley, Yorks.  
Bell, Joseph, B.Sc., Portstewart, Northern Ireland.  
Berry, Cecil Vernon, B.Sc., M.I.C.E., Chichester.  
Cave, Roderick George James Munro, A.L.A., Mona, Jamaica, T.W.I.  
Cohen, Gerald Selwyn, Manchester.

Cole, Mrs. Sibylle, Birmingham.  
Davidson-Houston, Major James Hamilton, M.A., London.  
Duff, Donald James, M.Sc., B.Ed., Hudson Heights, Quebec, Canada.  
Giddings, Ronald William, Old Coulsdon, Surrey.  
Hamzawala, Miss Fatima Hasanali, B.Sc., Bombay, India.  
Henriques, Theodore John, B.Sc.(Eng.), M.I.C.E., Rio de Janeiro, Brazil.  
Hughes, Walter Lindley, Glasgow.  
Jackson, Sir Willis, F.R.S., Manchester.  
MacLean, John Tenbroeke, F.R.C.S.(C.), F.A.C.S., Westmount, P.Q., Canada.  
McIlquham, Walter Scott, B.Sc., P.Eng., M.E.I.C., Westmount, P.Q., Canada.  
Marrington, Leonard Sidney, B.Sc., Bournemouth, Hants.  
Newton, Ian Martyn Frederick, N.D.D., Scunthorpe, Lincs.  
O'Neal, William B., B.Arch., Charlottesville, Va., U.S.A.  
Packer, Alfred Sydney, Coventry.  
Portman, Raymond Dennis, Stourbridge, Worcs.  
Russell, John Laurel, Montreal, P.Q., Canada.  
Stacey, Simeon Frederick, Ravenstone, Leics.  
Sweet, Herbert Edgar, Maidenhead, Berks.  
Tattersall, Derrick, B.A., Millom, Cumberland.  
Thornhill, James Frederick Patrick, B.A., London.  
Travers-Wakeford, S./Ldr. P. F., O.B.E., R.A.F.(retd.), London.  
Young, Donald Ramsey, Ph.D., L.H.D., New York, N.Y., U.S.A.

The following candidate was duly elected an Associate Member of the Society:

Cook, Miss Nora, Whitley Bay, Northumberland. (Examinations Silver Medallist.)

The following Companies were admitted into association with the Society:

Accles & Pollock, Ltd., Birmingham.  
Bendicks (Mayfair) Ltd., London.  
Gray's Carpets and Textiles Ltd., Batley, Yorks.  
Imperial Chemical Industries Ltd., London.

#### ANNUAL RECEPTION

Consideration was given to a preliminary report from the Committee set up to propose arrangements for the first Annual Reception, and it was agreed that this should be held on 3rd March, 1960.

#### CONGRATULATORY ADDRESS TO THE TEXTILE INSTITUTE

Approval was given to an Address of congratulation from the Society to the Textile Institute on the occasion of its Golden Jubilee.

#### EXAMINATIONS

It was reported that 37,368 entries had been received for the Autumn series of examinations, an increase of 8,847 over the corresponding figure for the previous year.

#### OTHER BUSINESS

A quantity of financial and other business was transacted.

# THE ROYAL SOCIETY OF ARTS— YESTERDAY, TO-DAY AND TOMORROW

*The Inaugural Address of the 206th Session by*

OSWALD P. MILNE, F.R.I.B.A., J.P.,

*Chairman of Council of the Society, delivered to  
the Society on Wednesday, 4th November, 1959*

In a foreword to the *History of the Royal Society of Arts*, our President, H.R.H. the Duke of Edinburgh, wrote: 'By its persistent and unobtrusive activities the Society has been an agent behind many notable developments, the good effects of which are felt to-day, but it has always tended to do good by stealth, and its great achievements are far too little known.'

Since I was elected Chairman of Council of this Society the truth of this has been borne in on me. So many people have asked me, 'What is the Royal Society of Arts? What does it do? What does it stand for?' It is natural that, amid the numerous organizations and specialized societies that exist to-day, the public at large has a very scant idea of our work in the past and of our activities at the present time. Thus in this inaugural address at the beginning of the 206th Session I make no excuse for speaking of what the Society has done, is doing, and how it is facing the future.

Proud as we are of the part played by the Society through the years and its record of usefulness, it is the present and the future which to-day are our particular concern.

The Society, although it has never lost sight of the original aims of its founders, has continually adapted itself to new outlooks and new thought, and has widened its horizon. Indeed I would claim that it is now as vigorous and active as at any time in its history. Nevertheless, it behoves us constantly to take stock, review our activities, and determine new lines of policy, remembering that a new and exciting world is being forged. After all, we are standing on the threshold of the era of nuclear energy and more and more automation.

May I now remind you of the year 1714, when William Shipley was born? He became a drawing-master in Northampton. Being a man of good will towards his fellow men, he conceived the idea that mankind, and in particular the poor, would be benefited if what we now call 'consumer goods' were cheaper. He thought this could come about if the new-fangled machines, a tremendous innovation, could be brought to their making.

Being, as I have said, a drawing-master, he felt too that the art of drawing must be beneficial in many employments and should contribute to the design and manufacture of goods. He came to London and there was fortunate enough to interest in his dreams two influential men, Lord Folkestone and Lord Romney. Through them a society described as 'A Design for the Public Good' and for the

Encouragement of Arts, Manufactures and Commerce was founded. Such is the first, and still the official, description of the R.S.A. A Society offering medals and prizes to stimulate invention and to encourage boys and girls in the art of drawing, by giving rewards, was the idea; that art and industrial efficiency should be linked; that youth should be encouraged to fit itself to the service of industry; and that by these and other means British Manufactures and Commerce should be promoted. These ideas have been the continuing inspiration of the Society.

It is evident that the aims of the new Society appealed to the spirit of that age. Those years of the mid-eighteenth century had a certain parallel with our own. Outwardly it was a quieter, more dignified, slower-moving age, but there was an inward ferment of activity, and dreams of increasing prosperity possessed men's minds. Soon this appeared to be within their grasp by the use of power-driven machinery. In the second half of the eighteenth century the British were adventuring around the world; we were peopling America; we were conquering India and Canada, and had discovered Australia—trade began to move in greater volume over the inhabited globe.

A society devoting itself to the public good, and promoting industry and commerce by the practical application of mechanics and science, caught the imagination. By 1763 its yearly income was £4,614, a not inconsiderable sum for those days, and by 1770 the membership had reached 1,880. Twenty years after its foundation, being firmly established, it was taking possession, at a yearly rental, of *this very house in which we are meeting to-day*. It was designed for its especial use by Robert Adam and this lecture room is virtually the same in structure, if not in actual appearance, as it was when the Society took up its quarters here.

I cannot here follow the growth and activities of the Society in any detail. The giving of premiums and medals had a considerable success and some useful inventions were rewarded, but very soon we find the Society taking an interest in promoting the welfare of the workers and in trying to bring into use alternative methods of manufacture where processes were injurious to their health. It interested itself in the improvement of agriculture, of transport, and in the discovery and importation of raw materials; really it acted in some respects as an embryo Board of Trade and Ministry of Labour. Naturally these functions grew too large for a voluntary body without any resources other than its own, and such activities have long since been merged in Government Departments. The Society too was the first organization to stage an exhibition of pictures and sculpture, and having made a success of this venture it had the wisdom to hand over the business of exhibitions of fine art to professional artists and architects. Thus arose the Royal Academy of Arts with its yearly exhibition. The Society returned to its rôle of encouraging enterprise and initiative in any direction that seemed useful, and in finding young artists who could be directed to the art of design in industry.

Not quite a hundred years after the foundation of the Society Prince Albert became its President. He impressed upon it that one of the main objects of its

existence must be the application of Science and Art to industrial purposes. Spurred by that injunction, the Society initiated the project of a great Industrial Exhibition, and took a leading part in the organization resulting in the Great Exhibition of 1851. This great achievement marked the astonishing progress which British industry was making in the middle of the nineteenth century.

Since that day the Society has taken a leading part in a campaign for the improvement in the design of British manufactures and in the training and recognition of the industrial designer. For a time progress was slow. Let me now go on to the period 1914-39. Between the wars advances were made. The founding of the British Institute of Industrial Art and of the Council for Art and Industry were efforts to put the training and status of industrial artists on a proper basis. Later, the institution (with the assistance of public funds) of the Council of Industrial Design with its popular Design Centre in the Haymarket, and the reorganization of the Royal College of Art on the lines of a University of Design, are some of the important steps taken, and the R.S.A. has lent its influence and support to all these movements. But perhaps the step which has most fully gained recognition and a professional status for the designer for industry, was the institution by the R.S.A. of the Faculty of Designers for Industry of the R.S.A., to which the Crown, a few years later, granted the title of 'Royal Designers for Industry'. Admission to the Faculty is granted by the R.S.A. and is limited in number, and is only given to those who have proved their worth. It is a high honour justly prized.

To-day, as in the eighteenth century, there is a great surge forward in men's thinking. There seems little limit to the inventive capacity of mankind which, guided by science, technology and mechanization, is revolutionizing methods of industrial manufacture. New processes and new materials are displacing the age-old crafts. Moreover rapid social change is affecting our outlooks and habits of thought. Accepted canons in art and design are all in question. A new look is transforming the appearance of the modern world. For example, if we observe the changing shape of our towns, and of the individual buildings which go to their making, we see that the art of Architecture is seeking new expression. For long architectural forms have been based on traditions. Now the philosophy of a new architecture is no longer a cry in the wilderness. To a generation schooled in traditional styles, with all their beauty of natural material and skilled craftsmanship, the mechanical methods and synthetic materials of mass production may seem soulless. We may, and do, grow a little weary and bored with the horizontal lines of glass and the crude forms and uncompromising skylines conditioned by concrete and steel construction, as well as by the economic pressures of to-day. However, given time, I make no doubt, architectural genius will find a means of giving this architecture quality, form and elegance, and the rigidities of steel and concrete will take on a 'style' of their own. It took a Sir Christopher Wren to create, from classic forms, an architecture in complete harmony with the English scene. It took a Lutyens to regain traditional forms of English building, which had been overlaid by revivals and Victorian pomposities, and to impress them with the charm of his imaginative and creative gifts. The modern



architect is fearful lest his work be stigmatized as 'traditional', which has become, in his mind, almost a term of abuse. When again he has the courage to introduce light and shade, to allow say, the cornice (a feature which, after all, is functional as well as decorative) to recrown his walls, and when he has rediscovered symmetry, and when he takes pains in the refinement of his detail—the present rather bleak starkness may develop into a gracious style.

Architecture forms the background of our lives, and so it follows that our intimate surroundings, the interior of our houses, our furniture and the articles of everyday use are all assuming a new look. Function and appearance make more appeal than traditional forms. Here is a challenge for the manufacturer, and design ever assumes new and greater importance. *There is no sense in making anything unless it is of good design.* If production is in mass, how essential that the prototype should be right. What growing opportunities there are, at a time when the standard of living is rising rapidly, for all sections of the community, and indeed for all peoples throughout the world! What opportunities for lively and fresh approach to design and for the use of colour! People are in search of goods that look, wear and work well, and perhaps in their eyes to-day the look of things is almost exceeding the importance of quality.

We are also entering an age of common markets and freer trade between the nations. Extended markets will doubtless mean keener competition, and our industrial prosperity will depend a great deal on the quality of our designers. We have got to be on our toes, and be aware that our future depends on developing to the full all the latent ability there is in the country.

In its rôle of encouraging youthful talent the Society has enlisted the aid of various industries to act with it in providing and setting up the scheme of Bursary competitions for young designers and students in the art schools or for those who are already apprenticed to the trades. The winners are awarded bursaries (usually of £150 each) to be used in furthering their design education either by travel or by an opportunity to study processes and techniques in the factory. This scheme is administered by a Bursaries Board set up by the Society, and it ensures a most desirable contact between the Society, the industrialists and the Art schools. It is a matter of satisfaction to find that the majority of students gaining bursaries eventually enter the industry in connection with which they won their award.

In order to form even closer links with industry, the Society has inaugurated a new policy of admitting companies (both trading and industrial) into association with it. Sir Charles Tennyson, who was for many years the Chairman of the Industrial Art Committee and the Education Committee of the Federation of British Industries, has said, truly, that 'in the matter of design the most important step still to be taken is for Boards of Directors to become design conscious and formulate and carry through really comprehensive design policies, so that not only the goods produced but equipment, furnishings, packing and publicity material, indeed all that emanates from the organization, may have distinction and individuality'.

The closer relation envisaged between a Society which has ever fostered the



welfare of British trade and commerce, and industries themselves, is good in itself and might well justify an expansion of the scheme of finding talent of service to our manufacturers. For not only individual artists, but also design teams which might be further developed, are increasingly of fundamental importance to our industries.

Another activity of the Society is the well-organized examination system for the granting of certificates to young people who wish to enter trade and industry in an administrative or clerical capacity. These certificates are so well recognized and valued that in the past year some 330,000 papers have been worked for the examinations.

I have, in this brief sketch, dwelt mainly on the activities of the Society in the realm of industry and industrial design. In the time at my disposal I cannot deal in any adequate way with the many other sides of its work. I have touched on its interest in the fine arts, but I have said nothing of what the Society has done for music and how through its effort and drive, in 1873 a School for Music was founded in Kensington which subsequently developed into the Royal College of Music. Nor can I deal fully with the leading part the Society took in arousing interest in the unique heritage we enjoy in this country—I refer to the beautiful countryside with the lovely homes and villages which builders and craftsmen have created through the centuries. In this age of change, I think, all will agree that something of this scene is worth preserving for the delight of our successors. For this reason the Society organized, only a few years ago, a successful campaign for the preservation of fine examples of English cottage constructions such as the Arlington Row cottages in the Cotswolds and the whole village of West Wycombe in Buckinghamshire. In doing this the R.S.A. gave encouragement and impetus to other organizations to take up the work throughout the country, a work now carried on with skill and energy by the Society for the Protection of Ancient Buildings, and other active Preservation Societies, to say nothing of the work done by the National Trust.

Another facet of the Society's activity is the presentation of medals in recognition of outstanding work in the fields of industry and science. Of these, the great prestige of the Albert Medal is, I think, well known, with its long list of distinguished recipients. The Society also administers a number of trusts which have been founded over many years.

I cannot omit reference to the unique position the Society holds in the dissemination of knowledge both by means of its *Journal* and through the authoritative lectures given in this Lecture Hall. Every week men and women who are masters in their subjects, be they art, science or culture, are to be heard here. Thus we are kept abreast of the application to industry of new discoveries, processes and techniques.

May I also pay a tribute to the Commonwealth Section of the Society, which deals with matters of great importance to welfare and development throughout the Commonwealth. This section has its own Committee and its own series of lectures. Taken with the increasing number of Fellows not only throughout the Commonwealth but also in the United States of America, this means that

the cultural and educative work of the Society is being carried far beyond our own shores.

I spoke a little while back of the time when the newly formed Society took up its quarters in this house. With the great expansion of its work and activities since that time it is small wonder that its original home proved very constricted, and indeed since the last war it has had to find premises elsewhere to house the Examinations Department and its printing works. But the headquarters staff, and all the work of the Committees, etc., remained and were carried on here, as best they could, in overcrowded conditions. Three years ago the opportunity occurred of acquiring the freehold of the three adjoining houses in John Adam Street. These were houses built at the same time as Robert Adam was building the house for the Society. They had been occupied for years as private dwellings and later as offices. In a manner they were all of a piece with our house, being of the same date, and together with it they form, with two other small blocks, all that remains of the original Adelphi scheme of the Adam brothers. The opportunity to acquire them was one that could never recur, and the Council of the Society felt that however much it might strain the Society's resources it must be seized. With full faith in the future of the Society, they took a bold course and persuaded a leading insurance company to purchase the property and grant the Society a long lease, which incorporates an option to purchase the freehold within a specified period. This purchase price will, of course, have to be raised in the course of a few years, but we feel sure that the standing of the Society is such that, by prudent stewardship and the assistance of well-wishers of the Society, this step will be fully justified.

Houses built some 200 years ago, and for private occupation, of course needed a lot of work to be done to them before they could be suitably adapted for our use. But all that work has now been successfully accomplished and the whole of the premises have been connected up to our old original house and Lecture Hall. This has greatly improved the office accommodation for the staff and has enabled the Examinations Department to be housed under our own roof. Now, too, we have some spacious rooms for exhibition purposes.

Before I sit down may I be allowed to make a speculation as to the future?

Looking around at the astonishing changes which have come over the social scene in the last decade or so—the increasing standard of living; the growing comfort and easier conditions of the people as a whole; the abounding vitality and general prosperity of British industry—the picture for the future might seem set fair, provided of course that the world does not plunge into war.

The vast strides taken in science and applied engineering are making possible developments for increased well-being everywhere, including the backward regions of the world. So much is waiting to be done that there seems no need to fear prolonged periods of unemployment for anyone who is prepared to give brains or labour to these purposes. There is no doubt that British industry is taking up the challenge with energy, and is re-equipping itself, and is intensely alive to the opportunities that science, invention and new technologies are revealing more fully every day.

Harmony alone is lacking. Is it true that habits of thought tend to become atrophied, and that instead of our minds moving into a climate more suited to our scientific and social advances they incline to cling to outworn ideas and outdated methods? By now surely it should be an accepted axiom that the interlocking and interplay of industrial effort, or non-effort, affect all. None benefit by dislocation or breakdown. In a time when the fruits of our industrial work are benefiting all, the malaise of labour troubles is an unhappy hangover from less enlightened days. The younger generation has unrivalled opportunities in education, health, comfort, and all are within their grasp. It is very well worth considering whether the importance of human relationships in industry—I would go so far as to include those between the followers of Science and the followers of the Arts—is not worthy of a place in our curricula, our lectures, our examinations, and our awards.

Neither automation nor mass methods can absolve any of us from personal responsibility—'Let me not to the marriage of true minds admit impediment'.

England has a tradition for holding a foremost place in industry and manufacture. By the great Exhibition of 1851 it showed how it was leading the industrial world. Might it not now again show the world how relations in industry might be rationalized, and where surviving anachronisms might be brought to an end?

The R.S.A., a Society formed over 200 years ago, a voluntary Society for the promotion of Arts, Manufactures and Commerce, has no politics and stands completely independent. It has shown in the course of its history that it is actuated without thought of individual gain, to serve the public and benefit our industries, and it has demonstrated its interest in the welfare of the worker:

Perhaps through its influence and leadership it might take some part in bringing about a new spirit in the industrial world, and in that way show itself as 'a Design for the Public Good'.

*Before his Address, THE CHAIRMAN made the customary presentation of the Society's awards. He first presented Silver Medals awarded for outstanding papers read during the past Session to the following:*

*For Papers read at Ordinary Meetings*

Christopher T. Brunner. 'Large Scale Organization and Change: a Study in Oil Marketing'

Dr. D. C. Martin. 'Some Achievements of the International Geophysical Year'

Dr. D. Stafford-Clark. 'The Contribution of Psychiatry to Modern Medicine'

Julian S. Tritton. 'The Consulting Engineer and his Contribution to the National Economy'

The Earl of Verulam. 'Trade and the Bamboo Curtain'

*For Papers read at Meetings of the Commonwealth Section*

S. H. U. Bowie. 'The Uranium and Thorium Resources of the Commonwealth'

*The following lecturers, who had also been awarded Silver Medals, were unable to be present to receive them in person:*

*Ordinary Meetings*

Walter Dorwin Teague. *'The Growth and Scope of Industrial Design in the United States'*

*Commonwealth Section*

Dr. R. S. Millard. *'Road Development in the Overseas Territories'*

*Next, THE CHAIRMAN presented a THOMAS GRAY MEMORIAL TRUST Silver Medal to:*

David M. Bissett, *for obtaining the highest marks in the 1958 Ministry of Transport's Extra Master Examination*

*The next award, also of a THOMAS GRAY MEMORIAL TRUST Silver Medal, to Mr. Nitibhusan Chakraborty for obtaining the highest marks in the 1958 Ministry of Transport's Extra Chief Engineer Examination, was accepted from the Chairman by Mr. B. Sen, Acting Education Adviser, Office of the High Commissioner for India*

*Then THE CHAIRMAN presented a HOWARD PRIZE of £50 to:*

A. N. Byford, *for his essay, 'A Possible Nuclear Reactor System for the Propulsion of Smaller Ships'*

*Finally, THE CHAIRMAN presented a FOTHERGILL PRIZE of £10 to:*

E. C. Simpson, *for his essay, 'Safety in Paraffin Oil Heaters'*

*At the conclusion of the Chairman's address, SIR ALFRED BOSSOM, BT., LL.D., F.R.I.B.A., J.P., spoke as follows:*

On this occasion it is the privilege of the previous Chairman of Council to express his thanks to his successor. In this case, I assure you, they are most sincerely offered for Mr. Milne's review of the past, the present and the future of this honourable Society. We all know Mr. Milne as a great respecter of tradition. He was at one time Mayor of Hampstead, and you know what they have accomplished in Hampstead; they have preserved a lot of very good buildings, and very good buildings are not being preserved in a good many other places.

I think we are going to see in the future what Mr. Oswald Milne has just indicated as a possibility, the formation of a society not for the preservation of *rural* England, but for the preservation of *urban* England. I do hope that when we are improving our buildings, improving the standard of living of all our people, we shall always think carefully of the magnificent things that have been constructed and created by our forefathers, our fathers and ourselves. We have

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INAUGURAL MEETING

all done something towards adding to this heritage in one way or another. Mr. Milne, as you know, is an architect. I was an architect too. I think it is the first time in the history of this Society that one man of one particular profession has been succeeded by a better man of the same profession! Mr. Milne has been connected with the Society for over half a century—a tremendous period—and during all that time, as I think everybody will agree, the Society has been getting more influential, more useful, and it has been doing better work for the community. Mr. Milne said we are a servant of the community—that is indeed what we are.

We sincerely hope that Mr. Milne will be long spared—I will not say for another fifty years!—but long spared to look after the Society's function in this way.

*The vote of thanks was carried with acclamation, and the Chairman of Council spoke briefly in reply. The formal proceedings then ended, and the company adjourned to the Library, where tea was served.*

# MODERN TECHNOLOGICAL AND COMMERCIAL EDUCATION

*Three Cantor Lectures*

## I. EDUCATION FOR INDUSTRY AND COMMERCE

by

A. A. PART, C.B., M.B.E.,

*Under Secretary, Ministry of Education*

*Monday, 9th November, 1959*

Almost exactly thirty years ago, one of the school certificate forms at Harrow were waiting at 7.30 in the morning to make the acquaintance of their form master, a veteran classic. This first lesson of the day always began with prayers. He stalked into the room, took his place at his desk, and the first words that he addressed to us were: 'We'll start with the general confession. Speak up!'

Things have changed since then. But at that time I should have been surprised if anyone had told me as a budding modern linguist that I should one day find myself speaking on technological and commercial education at the Royal Society of Arts as a result of a bequest made in 1860 by a surgeon in the Indian Medical Service.

I am nonetheless grateful to Mr. Cantor, to the Society for honouring me with this invitation and to all of you who have come here to-day to form such a distinguished audience.

May I deal first with one technicality? It is, I understand, the practice to print these lectures in the Society's *Journal*. In this case the lecture that is printed will not be quite the same as the lecture that is delivered. The printed version will be rather fuller and will include more statistics than seem to me to be tolerable at six o'clock on a Monday evening.

The public image of institutions in this country is slow to change and I believe that there are many people who still think of the technical college as 'night school'. Even among educationists, how many realize that, nowadays, more boys who leave grammar schools go to technical colleges than to universities? Or that of those who qualify for professional status every year, one in six of the scientists and two out of every three of the engineers have gained their academic qualifications in a technical college? Or even that about one-third of the boys under the age of eighteen who have left school attend a technical college?

These facts alone remind us that further education cannot be planned in isolation. Quite apart from industry (about which I shall say a good deal later), there are in the education service three stages which interact—the schools, the universities and the colleges of further education. The relationship between schools and universities, though by no means free from problems, is well understood. The further education system has, however, followed its own evolutionary

path up to the point where it now overlaps the schools at one end, and the universities at the other. Now is a good time to step back and see whether the pattern makes sense in a modern context. Here I must add that in all that follows, I must be understood to be talking about England and Wales only. Developments have taken place on broadly parallel lines in Scotland and Northern Ireland, but I must not express any views about them!

In the schools a number of striking developments have occurred. First, the number of children in school has risen from just over 5 million in 1947 to 6.8 million in 1958. The increase in total numbers is now levelling off, but the increase in the secondary schools is continuing at full speed and will not reach its peak until 1961. This is not simply a matter of larger age-groups. The last few years have seen a remarkable growth in the number of pupils staying on in secondary schools for extended courses of education. For example, the number of 16-year-olds in school in 1958 was 35 per cent, and the number of 17-year-olds 55 per cent greater than the corresponding numbers in 1951.

The second point follows from these figures. Fairly reliable estimates can be made for the number of school children leaving school at various ages up to 1965. These show that the number of leavers aged 14-15 will reach a peak in 1962 at a figure 22 per cent higher than in 1958; the peak for 15-16 year-old leavers will follow a year later, and will be 62 per cent higher than in 1958; the 16-17 year-old leavers will reach their peak, 100 per cent higher, in 1964; and the 17-18 year-olds a year later, some 140 per cent higher. These figures are already fairly widely known. The point which deserves special attention is the welcome increase in the number of school leavers with 5, 6 and 7 years of school life behind them. In particular, the number of boys and girls able to profit from a course of university standard may well double between 1958 and 1965.

To complete the picture there is the continuing tendency for more and more boys and girls to choose mathematics and science as main subjects of study in the upper forms of the secondary schools. This tendency is well illustrated by a comparison of successes in the Advanced level of G.C.E. in 1951 and 1958, which shows increases of 94 per cent in mathematics, 78 per cent in physics and 53 per cent in chemistry. At all levels, and not merely in the sixth forms of grammar schools, there is a renewed emphasis on the importance of mathematics and science, an emphasis which is held in check by difficulties over the supply of suitably qualified teachers. The position here is likely to be one of continuing difficulty, at least until 1961/62. After that, when the total numbers begin to fall in the secondary schools, conditions should rapidly improve. Meantime, the G.C.E. figures alone show that the schools are doing a remarkable job.

What about the universities? A major expansion programme is in hand. And it is interesting to note that the proportion of the students reading science and technology, which was 24 per cent in 1939, was nearly 37 per cent in 1957-8. The proportion is still rising and is, I understand, expected to exceed 40 per cent by 1970.

What lessons are to be derived from all these developments in schools and



universities? First, we should be glad that there is plenty of talent available. Secondly, we should note that the strong trend towards a longer education will greatly help us to achieve the big increase in the upper ranges of skilled manpower that the country requires. Thirdly, in planning further education—and recruitment and training schemes in industry and commerce—we should take account of what is happening in the schools and universities. For example, we need to consider what should be the effect on apprenticeship schemes and technical college courses of the desirable trend towards fifth-year courses in secondary modern schools or the effect on advanced commercial courses and recruitment into, say, accountancy of the rapid growth of sixth forms. At present, the boy with two G.C.E. Advanced level passes who becomes articled to an accountant gains no advantage over the boy who does so after leaving school with five passes at Ordinary level. And the boy who stays at a secondary modern school beyond his sixteenth birthday may be denied a craft apprenticeship.

Fourthly, we should note that the universities at present do not produce much more than half of the scientists and technologists and that however fast they may expand there will be the need for an alternative route on grounds of quantity alone.

At this stage, it may be helpful to present a perspective view of the educational opportunities available to young people at different ages in schools, universities and further education. This is done in the two Diagrams 1 and 2. For the sake of completeness, the teacher training colleges have been added.

Next week and the week after, Dr. Venables and Dr. McIntosh will be giving full accounts of technical and commercial education respectively. Dr. Venables will, no doubt, be speaking about the five-year plan announced in the White Paper on Technical Education and the three-year plan that is to follow it, about the success of the building programmes and the striking increase in sandwich courses, developments in craft and technician training, the rapid advance made by the Diploma in Technology and the creation of the new postgraduate award of Membership of the College of Technologists. Dr. McIntosh will be referring to the McMeeking Report, to the Ministry's circular approving it and to the problems facing the colleges and departments of commerce in giving a new modern look to commercial education. I expect there will also be references to the progress that has been made about Governing Bodies, regional co-ordination, libraries, hostels, liberal studies and, above all, the supply and training of technical teachers. Even this long list does not exhaust the topics which have been keeping Further Education Branch of the Ministry, and many other people, busy for the last three or four years. There are important developments in prospect in the fields of education for management (which will, I think, pleasantly surprise the author of the leading article in this month's *Technology*); architecture and building; art and agricultural education, so there is no lack of subject-matter for these lectures.

I thought it might be most helpful if I were to select a few general themes which seemed to me to be crucial to the whole programme of expansion.

First, there is the question of the organization of the colleges. Before 1956,



this problem was perhaps in some ways not so urgent. The colleges traditionally stood ready to meet any demands made upon them and it seems not unfair to say that the general idea was that, if a Principal had the initiative to put on a course for which he could find a legitimate demand, he was to be congratulated. With a massive expansion in prospect, it became clear that the structure of the colleges was too haphazard to support such developments as the emergence of the Diploma in Technology and a large number of sandwich courses. Shortage of highly qualified teachers of technology was alone a strong argument in favour of some rationalization.

As a result, the Minister of the day, who has now returned to us, designated eight colleges of advanced technology and issued Circular 305.

Diagram 3 shows the broad classification of the four main types of college which this circular described and the number of colleges in each group.

The fifth group consists of the national colleges, which are rather different from the others. While the local, area and regional colleges and the colleges of advanced technology cover a broad range of subjects, the national colleges, of which there are eight, were set up after the war to provide special facilities for advanced studies for industries of national importance which are too small to justify provision of such facilities at more than one centre.

In the local college part-time and evening work forms the bulk of the load, with some full-time work especially in commerce and clerical subjects. None of this extends beyond the level of the Ordinary National Certificate, which corresponds roughly, on a subject-for-subject basis, with the Advanced level of G.C.E. In the area college, again, the work is mainly part-time, though some have a few sandwich courses. The level reached is generally the H.N.C. for the part-time student, and the H.N.D. for the full-time or sandwich student.

With the regional colleges the balance begins to alter substantially. A much higher proportion of the work is above the level of O.N.C., and a number of these colleges have courses leading to degrees or Diplomas in Technology as well as H.N.D. Not a few have research and postgraduate students. A substantial amount of the work is done in full-time and sandwich courses, and this is the main distinguishing feature of a regional college. Hitherto regional status has been marked by the award of 75 per cent grant; but that disappeared when general grant was introduced and we are now considering how the definition of a regional college can best be expressed.

Finally, there are the colleges of advanced technology, which are required to concentrate exclusively on work at undergraduate and postgraduate level.

This structure is not intended to be rigid. That is to say, there are opportunities for colleges, as they develop, to move from one category to another. Since Circular 305 was issued, four area colleges have become regional colleges and one regional college (Bristol) will next year become a college of advanced technology.

I should have liked to say a good deal about colleges of advanced technology, for they are very important and they are something new in British education. But this is really Dr. Venables' territory and I must restrain myself from trespassing on it to-day. Perhaps, however, I might just make two points. The first

**FURTHER EDUCATION IN ENGLAND AND WALES 1957/58**  
**PERCENTAGE OF THE POPULATION IN EACH AGE GROUP IN EACH TYPE OF ESTABLISHMENT**  
**BOYS**

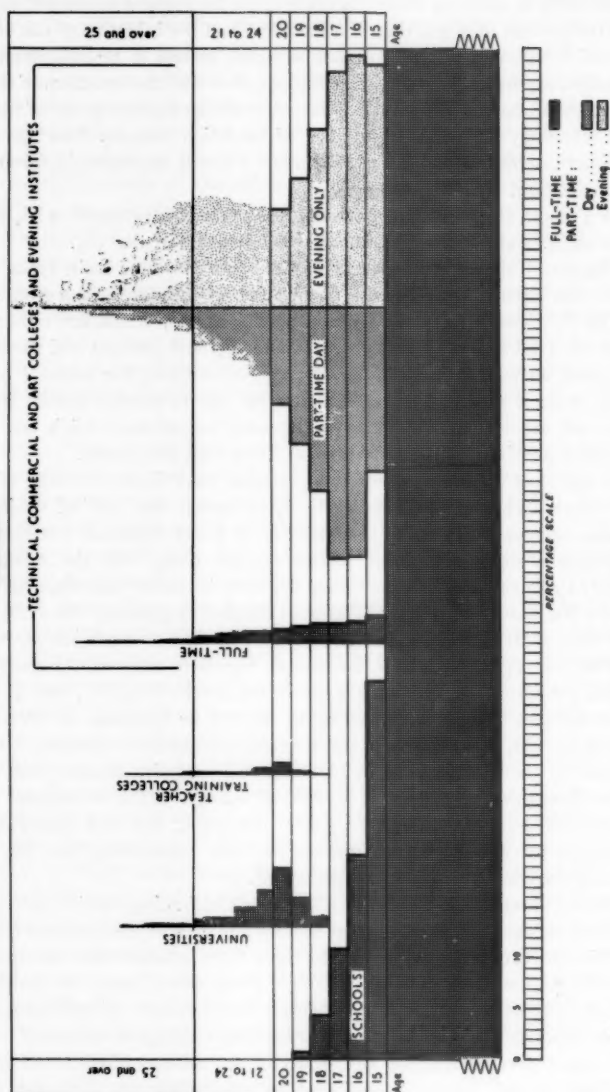


DIAGRAM I

# FURTHER EDUCATION IN ENGLAND AND WALES, 1957/58 PERCENTAGE OF THE POPULATION IN EACH AGE GROUP IN EACH TYPE OF ESTABLISHMENT GIRLS

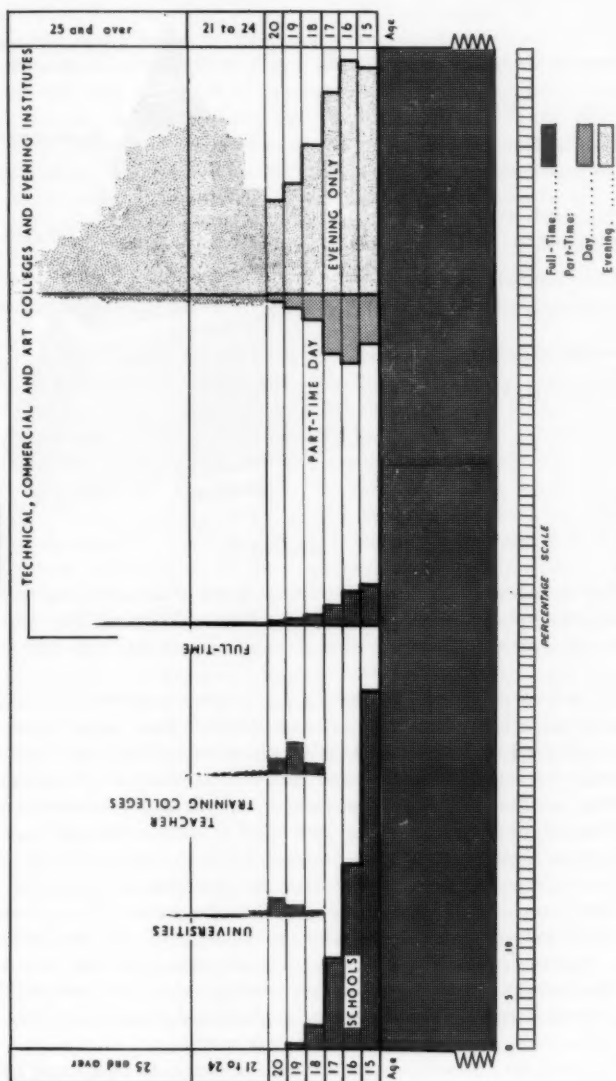


DIAGRAM 2

## THE PATTERN OF TECHNICAL EDUCATION

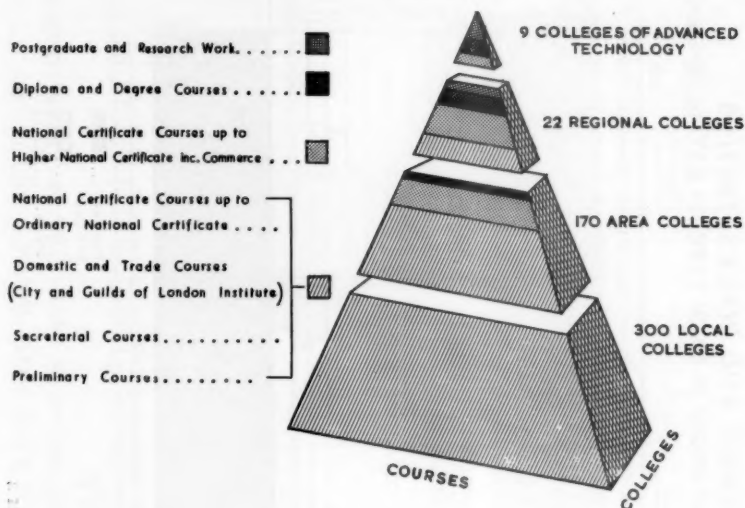


DIAGRAM 3

is that the essential characteristic of the colleges of advanced technology, which distinguishes them from universities, is their uninhibited link with industry, and their success will largely depend on the vigour and skill with which they exploit this.

My second point is about the balance between research and teaching. The present position in the colleges is rather different from that at the universities. The colleges have a fairly well-developed undergraduate base, with increasing attention to teaching method, and this will be steadily strengthened by the tutorial systems which all the colleges of advanced technology are being encouraged to introduce. If we can build on this a research superstructure centred on work for the M.C.T., we shall, I believe, have a well-balanced result.

Perhaps the most obvious fact about British Technical Education is that so much of it is part-time. Diagrams 4 and 5 show the position clearly enough. There are some obvious disadvantages of such a system. But the picture has another side. Day-to-day contact with a job provides some students with a powerful motivation which could probably have been gained in no other way. There are many young men and women whose progress in a college of further education surprises those who have taught them in school.

Nor must it be forgotten that the nature of part-time study itself has radically altered since the war. In pre-war days, a part-time course meant for the overwhelming majority of students an evening course. The part-time day release

course is a tremendous advance. The numbers taking these courses have risen from 40,000 in 1938 to well over 400,000 in 1958. But we cannot be complacent about the situation. For one thing, we are a year behind schedule in our efforts to double the numbers released for these courses in 1954-5, which is one of the main objectives set out in the White Paper. This short-fall is due chiefly to the fact that part-time day release is in practice usually tied to apprenticeships, learnerships, and so on, and industry has recently not been offering enough opportunities for skilled training. I have no doubt that energetic action will be needed if the position is to improve as fast as it should.

For one thing, part-time day education is very unequally developed in different industries and occupations. In particular, the world of commerce, whether one looks at banking and insurance or at the commercial departments of industry, has scarcely begun to think in terms of part-time day release. Further education for these occupations is in the state that education for industry was in twenty years ago.

Thirdly, there is not nearly enough integration between the technical education given in the colleges and the training given in industry. There are, I think, good reasons why in this country apprenticeship should continue to be a combined operation involving both industry and the colleges. But, in craft apprenticeships at least, the college share is fairly new as a regular element and there is often little sense of integration. For example, there are few trades for which the syllabuses of industrial training and academic study are planned as a single entity and printed side by side in the same handbook. It is also rare for students' success in college examinations to be recognized by a financial reward. And finally, there are very few trades in which there is any test at the end of an apprenticeship. To my mind—and I must emphasize that this is expressed as a personal view—the more widespread adoption of some or all of these measures would greatly improve the apprentice training in this country.

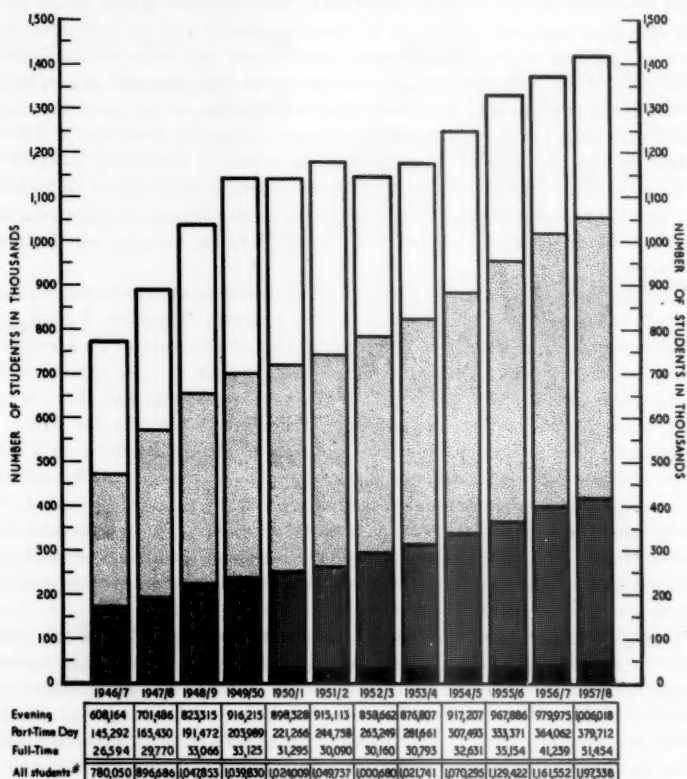
There are also other possibilities of integration. For example, there are some areas in which the training which would normally be provided in industry during the first year of an apprenticeship is provided on an agency basis in the technical college. This enables the college to offer a fully integrated one-year full-time course and, incidentally, to offer more general education than is possible when the first year of the course is spent partly in industry and partly in college.

Some of these remarks relate mainly to the problems facing industry. But I believe that we can do something to improve the position in the colleges.

To begin with, we can introduce a more coherent and up-to-date structure of courses. We at the Ministry have done a lot of thinking about this and we hope soon to consult our partners in the colleges, the professional institutions, the City and Guilds of London Institute and industry about our ideas. These proposals will take particular account of the growing need for courses at technician level.

Secondly, we believe that the selection of students for the various courses can be considerably improved. In the past, colleges have perhaps sometimes assumed too readily that a student should be allowed to take any course that he

# FURTHER EDUCATION NUMBER OF STUDENTS IN ALL ESTABLISHMENTS MEN



\* SINCE 1949/50 STUDENTS ATTENDING DAY AND EVENING AT THE SAME ESTABLISHMENT ARE COUNTED ONCE ONLY

Major Excess, Evening Institutes

EVENING.....  
 PART-TIME DAY.....  
 FULL-TIME.....

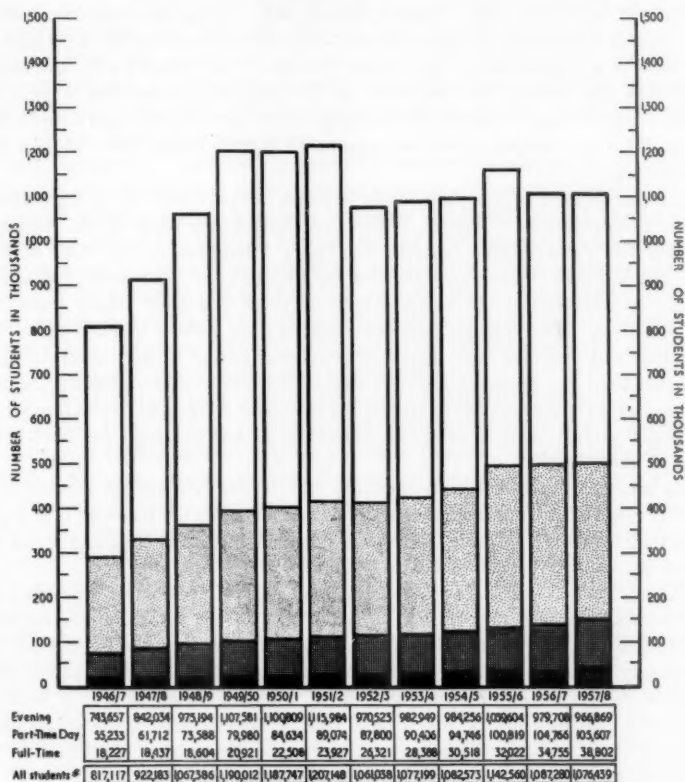
DIAGRAM 4

or his employer desires. It is true that the atmosphere of a technical college is different from that of a school, and the colleges are right to prize the advantage that this difference often gives them in dealing with teen-age students. But the need for a good deal of guidance remains; and there is room for more careful allocation and more research into the efficiency of various methods of selection.

# FURTHER EDUCATION

## NUMBER OF STUDENTS IN ALL ESTABLISHMENTS

### WOMEN



\* SINCE 1949/50 STUDENTS ATTENDING DAY AND EVENING AT THE SAME ESTABLISHMENT ARE COUNTED ONCE ONLY

Major Excess, Evening Institutes

EVENING ..... 
  
 PART-TIME DAY ..... 
  
 FULL-TIME .....

DIAGRAM 5

We are no longer in an era of keen volunteers. We are faced with a technical college course as an integral part of skilled training. It is tempting to be too kind to students and too obliging to employers, but there will be greater dangers if the colleges were to lay themselves open to accusations of excessive wastage of students or, to put it more bluntly, of wasting the taxpayers' and ratepayers' money.



Thirdly, we can do much to improve teaching methods. This means more teacher training. We are making a big drive on this and I hope that the results will soon become increasingly apparent.

Then there is the question whether rather more time in college can reasonably be claimed, at least for some courses. Among other things, we have to consider the possible advantages of block release. This has obvious merits, especially if it is used as a supplement to day release instead of a substitute for it. And some employers have already been attracted by the improved results that it tends to produce even though it means that the apprentices spend rather less time in the works. This is a subject which we propose to explore much more fully in the near future.

On other aspects of the partnership between industry and the colleges there is much improvement to report. With Lord Hives in the chair of the National Council for Technological Awards, Sir Harry Pilkington in the chair of the National Advisory Council on Education for Industry and Commerce, and many prominent industrialists to support each of them, we have strong teams at national level. The regional advisory councils have a more definite job to do than they had even five years ago, and governing bodies of individual colleges are gradually being reconstituted so as to give industry more suitable representation and stronger powers. Many large firms have done a splendid job on industrial training, and the growth of sandwich courses in the last five years has been little short of sensational.

But we need much closer co-operation still. There is room for a good deal more thought about the industrial training part of sandwich courses; it is good news that the Hives Council has set up a special Industrial Training Panel to review this aspect of the Diploma in Technology.

The next move must be to extend the sandwich principle both upwards and downwards. Upwards, by means of the M.C.T., the 'Hives higher award', which is to be given for a postgraduate programme of work carried out jointly in industry and at a technical college. This was announced a year ago and is now about to be implemented with the help of a distinguished Board of Studies under the chairmanship of Sir Arnold Hall. I believe that, when this award becomes established, it will be seen to be one of the greatest contributions to technological education ever made in this country.

Collaboration between industry and the colleges needs to be extended downwards too. I have already mentioned various possible improvements at the level of craft apprenticeships. But we must also consider with industry how far we should try to extend sandwich or block release courses to the emerging categories of technicians. We cannot sensibly set up courses for technicians until the various industries have recognized the need for such people. But this is a development which I feel sure is bound to come as industry grows more complex and the impact of automation is felt. Too many of our technicians to-day have not really been trained for the job.

The next main aspect of technical education on which I should like to comment is the attitude of the students. They are very 'vocation-minded'. Like part-time



day release, this can be both a good and a bad thing. The disadvantages are obvious. The students' eyes tend to be rather narrowly fixed on success in examinations, and they tend to be impatient of any attempt to introduce any 'extraneous' matter, or even to broaden the treatment of the technical subjects. This is partly a result of the lack of time. But it is also a reflection of a more fundamental fact. For boys and girls who have just left school and entered the world of work, that work itself, and success in it, are of tremendous importance. For many, entry into a technical college means freedom to immerse themselves wholly in an activity which really appeals to them and the relevance of which to 'real life' needs no demonstration.

Any attempts to 'liberalize' technical or commercial courses or to introduce voluntary—or compulsory—non-vocational courses must take account of this potential sales-resistance from the students. Sandwich courses remove, or lessen, the difficulty of shortage of time; but the sales-resistance tends to remain. To overcome it requires an imaginative approach by good teachers, and it is encouraging to see that several of the leading colleges have succeeded in attracting first-class people as heads of their departments of liberal studies. They need and deserve every encouragement. Here is one of the opportunities that are all too rare nowadays for real pioneer work in education.

To 'liberalize' part-time courses is even more difficult. The City and Guilds of London Institute have given a lead with their syllabus for Mechanical Engineering Craft Practice; this shows that a balanced course can be designed within a part-time framework. But to design such a course is one thing; to teach it effectively is harder. The truth is that the non-vocational element in further education for young people is at present very small and will be very hard to increase. But that is no reason for refusing to accept the challenge.

I now come to commercial education. Do not be alarmed. This lecture is not going to be as long again as it has already been! Much of what I have said already applies to commercial education; but there are some special features about commerce to which I should like to draw attention.

In some ways this subject can be easily disposed of by stating the following facts. One, commercial education lags behind technical education. Two, commercial education is for the most part still in the night school era. Three, there is no coherent structure of courses. Four, there are practically no sandwich courses in commerce. Five, many of the professional bodies in the commercial sphere have in the past paid scant attention to the colleges. Six, not many firms have yet given serious thought to this subject. Seven, many of the buildings in which commercial education is given are very poor. Eight, there is a shortage in several important subjects of suitably qualified teachers.

But I am glad to say that the picture is now beginning to change and will soon change more rapidly. The McMeeking Report which was published early this year made far-reaching proposals for re-organizing commercial education, and the Government has not only accepted them in principle but has promised to provide its share of the capital and other resources required to implement them. The Associated British Chambers of Commerce have launched an

apprenticeship scheme and firms are beginning to realize that it is no good training men to develop, design and produce if they do not also train men to administer their offices and to market the goods at home and abroad.

We at the Ministry have been heavily engaged on the most complex part of the whole operation: evolving a coherent structure of courses for the colleges. This is an elaborate business. It overlaps the work of the professional commercial bodies on the one hand and what have hitherto been the earlier stages of management studies on the other. As so often happens when an official rather than a Minister is due to make a speech, the time for an announcement is not yet quite ripe! But I can say with confidence that largely as a result of the help that we have received from many of the leading professional bodies, there is now a good prospect of arriving at a structure of part-time commercial courses which will be coherent and comprehensive.

This, however, is not enough. We must also encourage the development of sandwich courses, and when our negotiations about part-time courses are complete, we shall turn our attention to this question. Meanwhile, we welcome the efforts which some colleges are making to win the support of employers for sandwich courses and we hope that employers will be more responsive than they have been in some areas. It would be most unfortunate if the course at the Liverpool College of Commerce were to have to close through lack of support.

The realization of these aims in technical education is clearly going to require an ample supply of staff who are not only skilled teachers and well qualified specialists in their subjects, but are also in close and continuous contact with industry and commerce. The rate at which the teaching force in technical colleges is being increased is not always realized, and is bound of itself to impose stresses and strains. The total number of full-time teachers has in fact doubled in a period of seven years. Between the publication of the Government White Paper on Technical Education (February, 1956) and March, 1958, the total rose from 10,800 to over 13,600. A great many more will be required, not only to staff the new and expanding colleges but also to make possible some very desirable improvements both in teaching methods (for example, the introduction of the tutorial system on a wider scale) and in teaching conditions, such as the seconding of more teachers for advanced study, research and refresher experience in industry. The colleges are now receiving something like 2,400-2,500 new full-time teachers a year. Though this figure is encouraging, the colleges still find great difficulty in attracting enough qualified technologists of graduate or graduate-equivalent quality. There is an especially severe shortage of chemical engineers, electrical engineers and metallurgists, and it is by no means easy to find suitable men to fill key posts such as Headships of Departments, or Readerships in the colleges of advanced technology.

The remuneration of teachers in technical colleges has just been further improved with the approval by the Minister of the 1959 Report of the Burnham Committee. A young honours graduate with a few years' experience in industry may now expect to obtain a first teaching post in a technical college at a salary of not much less than £1,000 a year; the normal scales then range up to

a maximum of £1,900 for Principal Lecturers, with Readers in colleges of advanced technology getting up to £2,100. The maximum salaries of Heads of Departments range from £1,600 to £2,500, or higher in some cases.

We must hope that local education authorities and governing bodies will continue and increase their efforts to attract new staff by providing the right type of conditions in the colleges. Men and women of the right professional calibre will be interested in technical college teaching to the extent that they see teachers given more responsibility and drawn into a partnership with the governing body and with local industry through boards of studies and advisory committees. The highly qualified engineer or chemist wants to keep up the links with industry and to have opportunities to continue his professional contributions to his speciality through research and consultancy work. The technical college service can and should provide the gifted specialist with very favourable opportunities for activities of this kind. Other things also play their part—freedom to attend professional conferences and meetings, adequate staff common rooms, workrooms and clerical help. There is still much to be done if the colleges are to offer conditions which will prove a real spur to recruitment.

Future progress in the development of technical education may thus be seen to involve a threefold advance—in strengthening the partnership between the colleges and industry, in formulating a coherent and up-to-date pattern of colleges and courses, and in securing the staff on whom the success of the whole programme of expansion ultimately depends.

Underlying these aims is a more general one—to secure more widespread acceptance of a new concept of technical education and its place in the general education system. This is not as easy as it sounds. Technical education has too long been regarded by the British public as either a makeshift, or else a process which is scarcely education at all but rather part of the functioning of industry. The substitution for this old image of a newer one more in keeping with modern realities may well rank as a worthy task for a Society such as this, where forward-looking support for technical education will rank as not the least of its contributions towards the 'encouragement of Arts, Manufactures and Commerce'.

## II. TECHNOLOGICAL EDUCATION

by

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Technical education was an inevitable though tardily recognized consequence of the industrial revolution. Now it is accepted that it must be increased on an unprecedented scale if industry is to be able to use modern science and technology to the full. From its very nature, technical education has both specific and wider aspects which, however, have not equally determined the nature of its courses. The specific objectives have always been apparent and have, indeed, provided the mainspring of its development and the prime motivation of its students. Simply stated, they are '*learning for earning*' and '*learning while earning*'. In these respects it differs little in vocational incentive from education for the long-established professions such as medicine and the law. Nevertheless the emphasis on earning has, in the industrial context, often been to the detriment of the learning, so that it lacked width of vision and depth of penetration. Thus there has arisen, especially in the last decade, a growing awareness of the wider aspects of technical education which may also be simply stated as '*living while learning*' and '*learning for living*'. Student societies and residential facilities contribute to both these wider aspects, and general non-technical studies are beginning to play their part in 'learning for living'. Technical education has never been wholly restricted to that merely required for 'a hand', 'a worker', 'an employee', 'a productive unit' or 'economic man', though we have come all too slowly to the fuller concept of to-day. This is the realization that nothing less than an ample education for a human being, to enable him to play his part and enjoy his life in a democratic society which respects his individuality, will suffice; and that in this fuller education, the vocational incentive is both worthy and vital.

The increasing impact of science and technology has not only profoundly altered the nature of work done in industry, but has equally affected the organizational structure of industry, the different levels of employment, the relationships between them and progress from one to another. Six main levels may be differentiated: unskilled occupations, operatives, craftsmen, technicians, professional technologists and management; and further education has an important contribution to make at each level. Technical education, however, is concerned with the last five, but only latterly has there been any significant interest in education for operatives and management respectively. Individual firms can and do make their own contributions, according to their size and resources, at each level by training within the firm, especially in training to facilitate promotion. However, here again the technical colleges have a contribution to make.

The changing needs of industry at these five levels have brought about changes in the structure of technical education, or rather, the emergence of a definitive structure for the first time in its history. As indicated in the previous lecture, four different kinds of colleges are coming into being, broadly differentiated by the nature and level of courses they will provide. The point to be emphasized here is that the nature and level of work of the particular college is closely related to the needs of industry at the different levels of employment, and specialized needs will increasingly be met by specialized institutions. Instead of expecting the 'local tech.' to meet all or most of its needs as hitherto, the individual firm will increasingly select a college to meet the particular requirements it has in mind.

In 1957-8 the colleges provided for the needs of 90,256 full-time students, 485,319 part-time day students, and 997,552 evening students. As the emergence of such a structure was officially envisaged only in 1956<sup>1</sup> and as the existing provision was so varied and complex in its arrangements, Diagram 1 can only give a very broad picture of the structure to come. Moreover it perforce takes no account of other institutions such as, for example, the national colleges, works schools, and the technological faculties within the universities.

Six of the seven national colleges<sup>2</sup> were set up as direct grant institutions of the Ministry of Education to meet the needs of widely dispersed industries, which may account for the varying support these industries have given them. As the progress of a particular technology is greatly dependent upon a close relationship with related sciences and technologies, the creation of such small separate institutions is open to serious objection, and the White Paper might well have taken the opportunity to make them an integral part of the structure shown in Diagram 1.

Works' schools are very small in number<sup>3</sup> but are nevertheless important. Originally all were established by the respective firms for the training of their apprentices, but in some cases, while the premises still belong to the firm, the staff and finances are provided by the Local Education Authority. These schools are provided only by large firms and national organizations, and the numbers to be trained and the resources required make it very unlikely that they will greatly increase in number. The core of their work is specific practical training for craft apprentices and for some technicians. Though some more general education is undertaken, most of this, especially in science and mathematics, is provided through part-time day release of the apprentices to the local technical college.

The important technological departments of the universities will never be part of the structure shown in Diagram 1, since the universities are not part of the system maintained by the Ministry of Education and the Local Education Authorities. It may, however, be noted that at the beginning of the 1958-9 Session there were 14,942 students of technology in the universities (15 per cent of all students)<sup>4</sup> and that each year about one in six of the scientists and two out of every three engineers gain their academic qualifications in a technical college. It is too early to predict in what way this comparison will change,

QUALIFICATIONS		PRESENT NUMBER	LIKELY FUTURE NUMBER	TYPES OF COURSES	COURSES FOR
Dip. Tech., B.Sc. Lond., professional qualifications, post graduate diplomas; higher degrees & diplomas.	COLLEGES OF ADVANCED TECHNOLOGY	8	10 ?	PT + FT	University level only TGT + P + research + post graduate.
Some Dip. Tech. & B.Sc. Lond., professional qualifications, Higher National Certificates, City & Guilds Final Examination	REGIONAL COLLEGES	22	30 ?	PT + FT	Superior TN + C + some TGT + P + some post graduate
Some Higher & Ordinary National Certificates, some City & Guilds Final & Inter exams, general education eg G.C.E. Ordinary & Advanced level, domestic & catering courses (a)	AREA COLLEGES	60 ? (a)	110 ? (a)	PT + FT	TN + C + some P
Ordinary National Certificates, City & Guilds Inter & some Final exams, general education eg G.C.E. Ordinary level & some Advanced level, full-time domestic, catering courses etc. (a)	LOCAL COLLEGES OF FURTHER EDUCATION	175 ? (a)	225 ? (a)	PT + FT	TN + C + general education
Note (a) Commercial and art courses not indicated though many technical colleges have such depth & courses Note (b) Numbers given are estimated for colleges with substantial day work				PT = Part-time courses FT = Full-time courses including sandwich courses	TGT = Technologists TN = technicians C = craftsmen P = courses in graduation of professional institutions

DIAGRAM 1. *The new structure emerging in technical education*

depending as it must on the relative expansion of the universities, colleges of advanced technology and regional colleges, and the support accorded by industry to such new developments as sandwich courses.

Last, but by no means least, Diagram 1 makes no explicit reference to Art Colleges, and Colleges of Commerce. The position of both is confused by the existence of schools of art and commerce departments within technical colleges. The Royal College of Art is a long-established national college and there are designated Regional Colleges of Art, but it was a serious defect in the McMeeking Report<sup>5</sup> that it did not envisage some comparable structure of colleges of commerce to encourage the development of higher education in commerce.

Technical college courses are arranged in three main ways: full-time courses; part-time day courses, and evening courses, and the ratio of enrolments in them is 1 : 5.4 : 11.8. This broadly conveys the prevailing characteristic, that the system of technical education is far too dependent on part-time education to meet modern and future needs<sup>6</sup>. Within this predominantly part-time system an immense variety of courses is provided, many demanding exacting standards in science, mathematics and technology. Diagram 2 gives a simplified picture of the variety of day courses—how simplified may be seen from the fact that the arrangements for courses leading to City and Guilds examinations, columns 13, 14 and 15, cover over 200 different subjects.

Diagram 2 takes no account of evening classes, not because they are no longer useful, but simply because they cannot of themselves form the basis of

modern technical education. The customary pattern of day release is now of one day a week in the employer's time and of one evening in the employee's own time. With higher standards to be attained, this is no longer satisfactory, and we should look forward, not to increasing the number of evenings given up by the student, but to enlarging the time available in the day time. This may be done by increasing the length of the session for one day a week attendance (6 hours a day for 36 weeks, i.e., about 220 hours), to the county college arrangement of the 1944 Act (330 hours =  $7\frac{1}{2}$  hours a day for 44 weeks). This would require a radical change in the academic session for the colleges and entail an appropriate increase in the teaching establishment (if not, what was envisaged in the 1944 Act?). Time in the day can be substantially increased by increasing transference to sandwich courses as shown in columns 8 to 11 of Diagram 2. Day-time attendance may be concentrated, but is not increased in 'block release' courses (column 18, Diagram 2), in which the equivalent of one day a week is arranged in an eight-week full-time course. The student usually attends one evening a week, to keep in touch with the college and keep up his studies during the rest of his year full-time in industry, so that the total attendance is about 300 hours (8 weeks at 30 hours and 28 weeks at 2 hours). Examination results of students in these courses are generally much superior to those in day release courses.

Five features of technical education portrayed in Diagram 2 require particular comment. *First*, there are no fixed ages for entry to courses and those indicated are the usual ones to which there are many exceptions. *Secondly*, for all major courses there is a required educational standard of entry but, if a student has not attained that standard, there is usually available in some college a preparatory course which will give him an opportunity to achieve it. Thus course No. 16 is preparatory to 17, and course No. 12 can lead to course No. 11. *Thirdly*, the diagram shows the minimum length of courses, whereas a large number of students do not complete them in the minimum time, but take one or more years longer, mainly because of failure in examinations on the way.

The *fourth* feature is the relationship of study to industrial training. Very few of the full-time courses are related to industrial training, though, as with some university courses, the student may gain some industrial experience during the summer vacation. In part-time day courses, industrial training is concurrent with weekly attendance at college but, whereas the course of study has to meet the examination standards of external bodies, the industrial training is determined only by the firm. The only exception is in the training of technologists who must satisfy either the requirements of the Diploma in Technology, or those prescribed by professional institutions for admission to associate membership.

Flexibility is the *fifth* and very important aspect of the system. This has already been implied in relation to age and standard of entry to courses, but it is even more important in regard to transference between courses. Such possibilities are shown in Diagram 2 by various arrows but two may be emphasized: first, the transference of able students from City and Guilds Craft Courses (columns Nos. 13, 14 and 15) to technician—National Certificate courses (column No. 12).



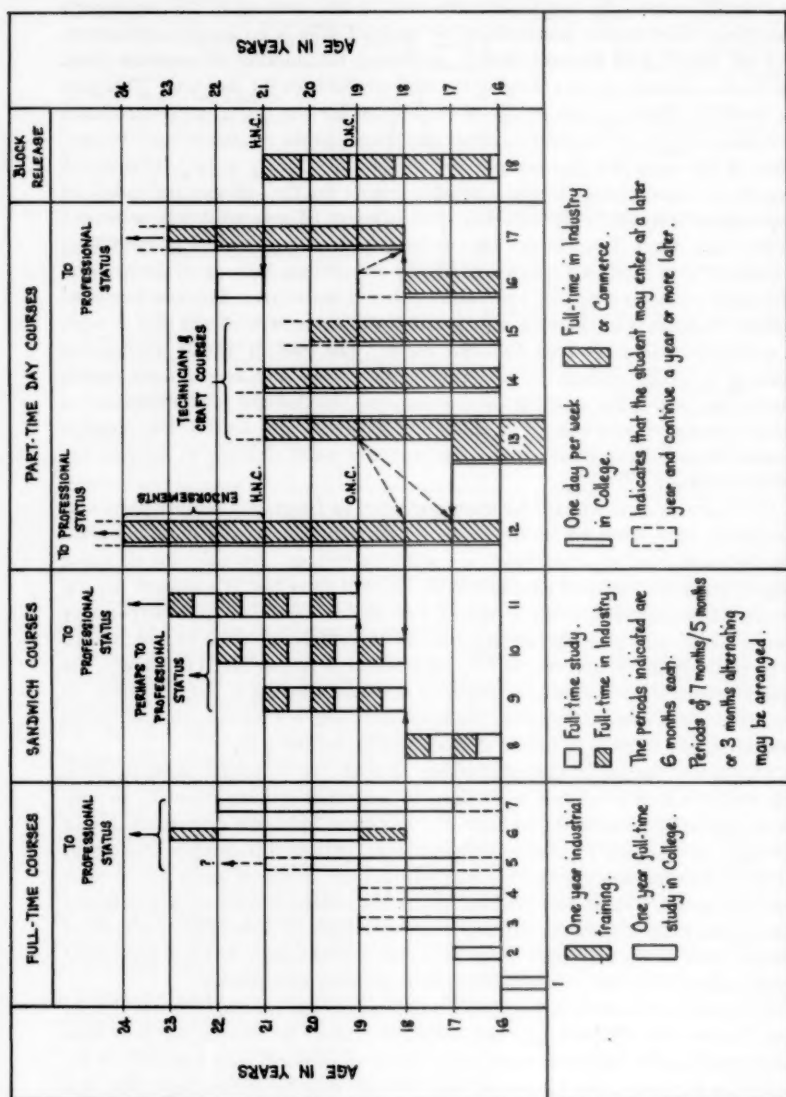


DIAGRAM 2. Technical education: outline of main day courses



DIAGRAM 2. *Technical education: outline of main day courses*

## FULL-TIME COURSES

1. One year full-time pre-apprenticeship course, may be taken in works, school or college.
2. Vocational courses, e.g., catering, secretarial, etc.; or general educational, e.g., G.C.E. Ordinary level.
3. General education, e.g., G.C.E. Advanced level, 2 years from 16, 17 or later.
4. Vocational courses 2 or 3 years, e.g., hotel catering, secretarial, commercial art; 2-year course for Ordinary National Diplomas, e.g., building, engineering.
5. Higher Diploma courses; 3 years, e.g., building, engineering, textiles. Professional courses.
6. University degree course, 3 years, e.g., London University in engineering, science, etc. Course for Graduateship of Royal Institute of Chemistry. Increased day release in final year(s), or finish with one year full-time study.
7. Diploma course in architecture for A.R.I.B.A., 5 years.

## SANDWICH COURSES

8. Ordinary National Diploma, e.g., in engineering.
9. Higher National Diploma, 3 years, limited exemption from professional examinations.
10. Higher National Diploma, 4 years, greater exemption from professional examinations.
11. Diploma in Technology, 4 years, complete exemption from many relevant professional examinations. Entry standards, G.C.E., 2 'A' level and 3 'O' level, good O.N.C., O.N.D. Main subjects—civil, mechanical, electrical, aeronautical, chemical, production engineering; building, chemical technology, applied physics, technological mathematics, etc.

## PART-TIME DAY COURSES

12. National Certificate course; 3 years to Ordinary (O.N.C.), then two years to Higher (H.N.C.), then 1-3 years for endorsements to exempt from professional examinations.
13. Course with common syllabus. Combined 15-16 years for selection purposes, then students go to National Certificate or Craft courses; such combined courses are still exceptional.
- 14-15. Craft courses to take City and Guilds examinations in building, engineering, textiles, etc., over 200 different subjects altogether. Final at 5 or 4 years, with extra year(s) for Full Technological Certificate.
16. General education G.C.E. Advanced level, leading to 17.
17. Final degree of London University (external degree), e.g., in engineering, science, etc.

## BLOCK RELEASE COURSES

18. Block release courses, i.e., full-time attendance equal to the total part-time day attendance for O.N.C. in 12. Student usually attends evening classes during the industrial periods.

NOTE: Not all arrangements can be shown and some, e.g., in industrial administration, are too varied to be included in the diagram; the same is true for management courses and postgraduate technological courses.

Though the National Certificate course can, as shown, lead eventually to professional status, the increasing tendency now is to transfer as many as possible of the able students to appropriate sandwich courses. Such transferences are indicated from column No. 12, to Higher National Diploma courses for technicians (column No. 9), and of the most able students to the Diploma in Technology courses for technologists (column 11).

These courses are not run in isolation, but in close co-operation with industry. They are, in fact, integral parts of the various routes from school to adult employment in industry for which relevant qualifications and training are required. The outstanding feature of the post-war period has been the way in which these routes have become clarified, and firmly established without losing the desirable flexibility already referred to. These arrangements are shown in Diagram 3<sup>7</sup>.

The term apprenticeship is now loosely used to cover both indentured apprenticeship, and learnerships of many kinds. Strictly speaking, indentured apprenticeships in the crafts entail a legal agreement, involving prescribed training for which the content and total period of training, attendance at technical college and wages are laid down by the appropriate National Joint Industrial Apprenticeship Council. Over 100 of these schemes have been approved, and these and the other apprenticeships (or learnerships modelled on them) have been a great stimulus in the tenfold development of part-time day release courses from about 41,500 in 1938-9 to 434,672 in 1957-8. Gratifying though this may have been, the outlook is far from satisfactory, especially with the large increase in the size of the age group leaving the schools over the next six years. For this reason the work of the Industrial Training<sup>8</sup> Council with Lord McCorquodale as President, will be watched with great interest, if not anxiety.

The need for a substantial rise in apprenticeships, and thus of technical education, is not simply a matter of the population 'bulge': it also raises the

TABLE I

NUMBER OF EMPLOYEES IN MANUFACTURING FIRMS OF DIFFERENT SIZES

*(Ministry of Labour Gazette, September, 1959)*

CATEGORY							
<i>Size of Firm</i>	11-24	25-99	100-499	500-999	1,000-1,999	2,000 or more	<i>Total</i>
No. of firms	14,874	26,145	12,052	1,524	742	402	55,739
Percentage of Total	26.8	46.9	21.6	2.7	1.1	0.7	100
	73.7%			1.8%			
	95.3%			4.5%			
No. of employees	258,000	1,326,000	2,492,000	1,048,000	1,021,000	1,590,000	7,735,000
Percentage of Total	3.3	17.7	32.1	13.8	13.2	20.5	100
	20.4%			37.7%			
	52.5%			47.5%			

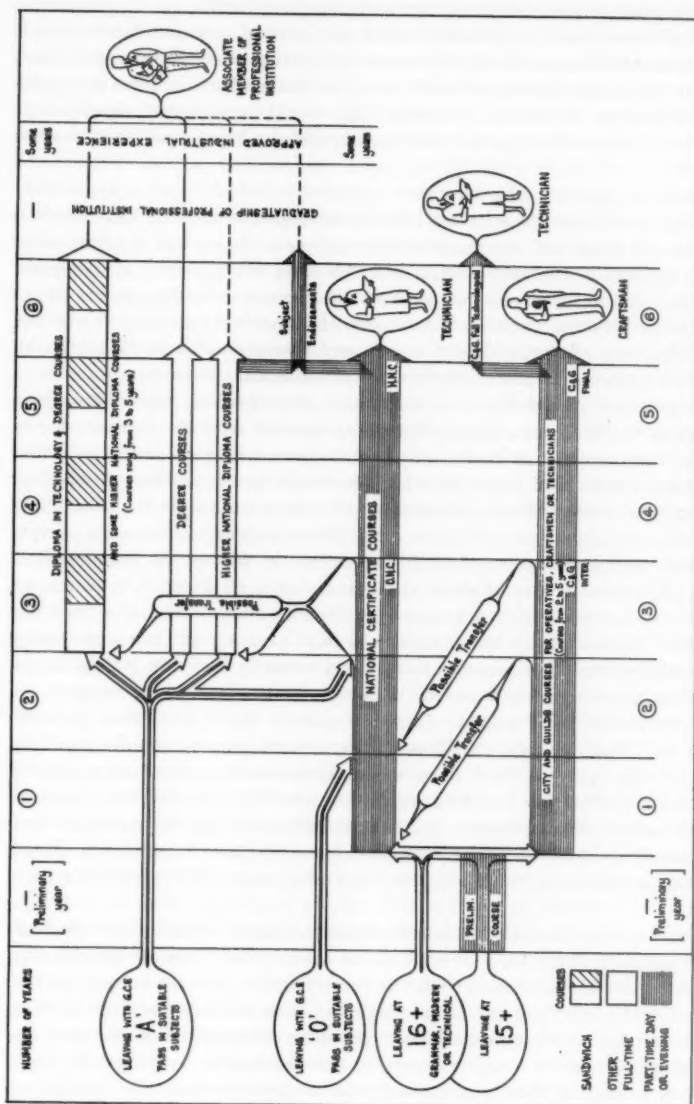


DIAGRAM 3. The routes from school to technical qualifications

practical matter of finding places for training within manufacturing industry, and here the structure of industry is a very important factor.

It is seriously open to question whether all the training places can be found, and whether joint apprenticeship schemes with groups of small firms should not be more widely established, especially using the local and area colleges as supplementary sources of practical training. This would be a logical development from the pre-apprenticeship full-time courses now also being established in some colleges.

Schemes of apprenticeship have been extended to include 'student apprenticeships' and 'graduate apprenticeship'. Both are designed to produce technologists, and normally entail full-time study over several years, the student apprenticeship mainly through a sandwich course, and the latter for a period of two years following a university degree course. There are several variations, and in one—sometimes misleadingly called a 'thick sandwich course'—a year is spent with the firm before attending the degree course and one year afterwards, while the summer vacations may also partly be spent in industrial training.

The post-war period has seen some new developments which have great importance for the future. Among the less spectacular ones are the new courses for operatives established by the City and Guilds of London Institute. These arose from industrial changes but were stimulated by the problem of teaching students with widely differing objectives and attainments within the same class, which led inevitably to serious failure rates. The new courses contain less science and mathematics, are more practical in approach; as also are the examinations. Two such examples are, Mechanical Engineering Craft Practice, now run in addition to the long-established course on Machine Shop Technology, and the Electrical Technician courses alongside the more exacting Telecommunications Engineering courses. In another field, the Chemical Operators course is an innovation, resulting from considerable changes in the chemical industry.

To provide incentive and recognition at a much higher level than its well-known Full Technological Certificates for craftsmen and technicians, the City and Guilds in 1952 instituted a new qualification known as the Insignia Award in Technology (C.G.I.A.). Candidates are accepted for registration on the basis of qualifications and experience, and then are allotted topics for a thesis which is rigorously required to be far more than a mere report of experience. About half those accepted succeed and up to September, 1959, 161 awards have been gained.

The growth and scope of technical education cannot be understood without some realization of the work of professional institutions. They are independent corporate institutions devoted (i) to the furtherance of relevant knowledge and skills; (ii) to securing and maintaining high standards of competence and conduct in their members; (iii) to maintaining appropriate standards of admission to the profession and (iv) to securing equitable and reasonable conditions for their members to pursue their profession in the workaday world. The balance of effort may vary considerably between these four main aims, depending on the history of the particular institution. In the pursuit of their aims, and particularly

in regard to (ii) and (iii), they have exercised a profound influence on technical education<sup>9</sup>. This has been partly as members of the Joint Committees, with the Ministry of Education, for the award of National Certificates and Diplomas; partly in approving technical college courses for partial or full exemption from their own examinations, as will be evident in Diagrams 2 and 3, and partly through their representatives on many bodies, especially advisory councils and college advisory committees. Moreover, most of the teachers in technological departments in the colleges are members of their respective professional institutions.

Since 1945 most of the professional institutions have raised, and some are again revising, the academic and practical training requirements for the profession. This is having a far-reaching effect on professional technological courses in the colleges. Firstly, the part-time route through the National Certificate system (Diagram 2, column 12) is becoming increasingly arduous and lengthy in order to fulfil these requirements, and will increasingly be replaced by the sandwich course system (especially for the Diploma in Technology). Secondly, subject to the usual adjustments over a period, the National Certificate courses are increasingly likely to become courses for technicians. There will be considerable opposition to this trend, partly from vested interests, and partly on the egalitarian grounds of retaining educational opportunity for as many as possible. Nevertheless, we should not set the student unreasonable tasks nor deny him the opportunity of a broader education.

Enrolments in sandwich courses have grown from less than 1,500 five years ago to over 8,000 in 1958, which is encouraging evidence that the need for better technical education is being increasingly appreciated in industry. The underlying purpose of these courses is in the integration of full-time study within the overall period of industrial training<sup>10</sup>. The idea is not new for it was introduced in Glasgow about 1880, at the Sunderland Technical College in 1903, and at the Northampton Polytechnic, London, in 1905. They are the British equivalent of the American 'co-operative courses' (justly so called because they cannot possibly succeed without the closest co-operation of industry and college), which began at the University of Cincinnati in 1906. It would appear that, until we had had many years experience of part-time day release courses, there was not sufficient basis of co-operation with industry to establish sandwich courses on a large scale. Be that as it may, an interesting picture of the number, range and character of sandwich courses can be derived from the Ministry of Education List 182 of Sandwich Courses approved for the Session 1959-60; and this is given in Table II.

Half the courses are of four years' duration and about one-third last three years, but there is a wide spread from one to five years. Three quarters are on the basis of six months college and six months industry, mostly for 3 or 4 years; nearly the same proportion (though not necessarily the same courses) start the college period at the beginning of the autumn term. About one quarter of courses start in the spring term, and about half of these are duplicate groups in the same session.

TABLE II  
ARRANGEMENTS OF SANDWICH COURSES, 1959-60

A. <i>Duration of Courses</i>				B. <i>Periods Spent in</i>			
				<i>College</i>	<i>Industry</i>		
5 years	...	24		6 months	6 months	241	
4 years	...	156		5 months	7 months	7	
3 years	...	92		7 months	5 months	2	
2 years	...	34		9 months	3 months	3	
1 year	...	13		3 months	9 months	2	
					Other	64	
			319				319
C. <i>Works or College Based</i>				D. <i>Starting Date</i>			
Works based	...	170		Sept./Oct./Nov.	...	220	
College based	...	17		Jan./Feb.	...	42	
Both	...	132		Both	...	47	
			319	Other times	...	10	
							319

Just over half the courses have only works-based students, i.e., the student is taken on by the firm, and has his wages paid throughout his periods of full-time attendance in college. College-based students enrol in college at the outset of the session, are eligible to receive grants during the college period, and are placed in firms for industrial training, receiving wages accordingly. Only 17 courses have college-based students only, whereas 132 out of 319 are stated to have both college-based and works based recruitment. In all the courses so far established the great majority of students are works-based, though more colleges are now thinking of college-based recruitment as well. This reflects the preponderant influence of the engineering industry so far, and Table III shows that 189 courses out of 319 are in engineering.

TABLE III  
SANDWICH COURSES: MAIN SUBJECTS

	<i>Eng.</i>	<i>Sci.</i>	<i>Bldg.</i>	<i>Com.</i>	<i>Met.</i>	<i>Oth.</i>	<i>Total</i>
Colleges of Advanced Technology	34	31	3	1	2	1	72
Regional Colleges ...	43	22	2	3	1	7	78
Area and Local Colleges ...	112	20	5	16	5	11	169
	189	73	10	20	8	19	319

Most of the recruitment has been from the large firms with well established training schemes and facilities for them, and this has been responsible for the dominance of works-based recruitment. Over the next 5 to 10 years the trend is likely to be strongly towards college-based recruitment; indeed, this must

be so if more technologies are to be involved; if the needs of the far more numerous smaller firms are to be met; if places are to be found for the larger numbers coming from the schools and lastly, but by no means least important, if the wishes of Commonwealth countries are to be fulfilled.

The great diversity of courses arising from industrial needs has led also to a confusing variety of qualifications hitherto obtainable by full-time, part-time day and evening courses. Already the list is long for sandwich courses and Table IV shows the main ones, though with an unspecified group of '48 others'.

TABLE IV  
QUALIFICATIONS GAINED IN SANDWICH COURSES

A. Qualifications			B. Distribution of :						
Dip. Tech.	...	70	(i) Courses for Diploma in Technology						
College Associateship...		13							
B.Sc. London External Degree	...	9							
Professional Qualifications	...	32	Colleges	Number of Courses		Students			
	...	32		Oct. 1959		Mch. 1959			
H.N.D. 3 years	...	60	Cs.A.T.	8	45	1899			
H.N.D. 4 years	...	30	Regional	12	23	554			
O.N.D.	...	8	Area	1	1	50			
College Diploma			R.A.E. Tech.	1	1	15			
	2 years	1		22	70	2518			
"	3 years	8							
"	4 years	11							
"	5 years	1							
H.N.C.	...	12	(ii) All Courses						
O.N.C.	...	11	Dip. Tech.	Prof. Quals.	HND.	OND.	HNC.	Oth.	Total
City and Guilds	...	8	Cs.A.T.	45	3	6	—	18	72
Others	...	45	Regional	23	9	16	1	29	78
		319	Area and Local	2	20	68	7	12	169
				70	32	90	8	12	319

The wide range of qualifications shown in Table IV is not surprising, as the sandwich course principle is applicable at all levels of technical education. It provides more advantageous conditions of study than obtain in part-time courses, but does so without sacrificing or postponing the equally important industrial training, as perforce happens when an able student transfers from employment with part-time day release to say, a three-year full-time degree or diploma course. It is this combination of ample conditions for study and industrial training which makes the present rapid development of sandwich courses one of the most exciting educational developments of recent years.

This large-scale experiment is hardly four years old, and there are many unsolved or only partially solved problems. First, there is the question of academic standards to be achieved, depending on entry standards, content of the course, teaching methods, and the conduct of examinations. For Diploma in Technology courses, the conditions for three of these are approved by the National Council for Technological Awards, but the Council is not a teaching institution nor an examining body<sup>11</sup>. Once the course is approved, the college is solely and fully



responsible for its own teaching, and for the conduct of the examinations with an External Examiner, recommended by the college and approved by the Council, acting on university lines in consultation with college senior staff as Internal Examiners. This is radically different from the system of External Assessors appointed by the Joint Committee for Award of National Diplomas and Certificates, and the enlightened way in which the new scheme has been administered, with its greatly increased academic autonomy, has been greatly appreciated by the colleges concerned.

Two important academic matters are the introduction of project work into the final year of each Diploma in Technology course and of 'liberal studies' or general studies in several years of the course. The aim of project work<sup>12</sup> is to require the student to apply what he has learnt to some practical technological problem germane to his studies or to his industrial training, so that it is largely self-educative in character. In the choice and use of project work perhaps lies the greatest responsibility and opportunity of the teaching staff, and it must neither be trivial, nor so vast and complicated as to daunt the student, nor to require an undue proportion of his time on preparative work. Suggestions for projects have come not only from the staff but also from the students' firms, which is very encouraging so long as the educational considerations prevail in the final choice.

In the field of general studies there is considerable ferment of ideas and much experiment<sup>13</sup>. Let us suppose that the scientific and technological studies are well taught, that the student has ample opportunity to start or support various societies and activities of his own choice, and to help to run them and the Guild of Students, in a democratically responsible way. In this he is truly 'living while learning'. Are any further general studies then required for his future responsibilities, happiness and understanding, when he should be 'living fully while earning'? Whereas in Diploma in Technology courses the need for such studies is conceded, ideas about them vary greatly. A close study of modern industry, its origins, development, impending changes, its problems of organization, communication and human relationships, may be favoured and there may be a progression through economics, psychology, philosophy, history, literature, art and design—either as chosen separate studies, or brought in as ancillary subjects to those rooted in the student's future employment. Full-time study is essential for anything like this to be attempted on a significant scale, and methods will vary. There may be required studies and some elective subjects; and also there may be special college lectures at which the students are confronted with the thoughts and achievements of distinguished people *in person*, with the opportunity to discuss great issues with them. It is noteworthy that 'social studies' have also been introduced at the far less exacting level of City and Guilds courses. Such students will also have a vote, family responsibilities and increasing leisure, and for them, too, technical knowledge and skills alone cannot provide all the answers to their questions and problems.

Two other major aspects of sandwich courses must be mentioned: the need to secure good co-operation between industry and college, and the need to secure

the integration of college study and industrial training<sup>14</sup>. For the first, certain means are being strengthened as in the work of College Advisory Committees, and new ones are being devised. Among these are College Joint Consultative Committees of Education and training officers of firms and heads of departments, and regular conferences of representatives of firms at the college to discuss practical problems and arrangements. Then there are Industrial Training Certification Committees, again with representatives of both sides (though with a majority from industry), to ensure the standard of the students' industrial training. In addition, visits of teaching staff to industry, to see students in training and for discussion on project work, research and other purposes, are increasing to an encouraging extent. These visits also ensure better integration of college study and training, but here there is much room for research and experiment.

In all the foregoing, the over-riding question is how to foster and secure first-class co-operation between industry and the colleges, whether the primary emphasis be industrial, as in the practical training (which is nevertheless highly educational), or whether it be in the academic studies (which nevertheless are industrially oriented). Regard must perforce be given to the nature of the studies, and the work and resources of the particular firm, and to the structure of the particular industry, as shown by the realities of Table I. One essential basis for this is that college staff should generally have had relevant (and successful) industrial experience, and that there should be enough of them to make really adequate contacts and so secure co-operation with the industry, bearing in mind that a single college may have students from hundreds of firms. With the successful involvement of smaller firms in education and training the number related to each college will greatly increase.

Studies undertaken in colleges do not finish with final technical examinations, for the problems of industry are not solely scientific and technological nor even primarily so. The principles and problems of industrial administration and organization, of communication and human relationships in industry, become especially important and can only be fully understood by the adult employee at particular levels of employment. Since the war especially there have been many developments, including a large increase in the number of organized courses in industrial administration leading to professional qualifications, and at other levels, e.g., in foremanship and for workpeople's representatives. Many short courses on special topics are organized, e.g., in factory management, the organization and control of production, the practice of work study, budgetary control, employee interviewing, assessing executive ability; courses for technical representatives, for personnel officers, and executive development courses; courses again in public speaking, in effective reading, and in communication; courses moreover in industrial law, product design and development and market research.

Such studies cannot be effective without the help of visiting lecturers and senior management tutors who are currently successful managers and executives in industry. Moreover, the nature of these studies, with the need for ample discussion of matters which are complex and are not susceptible to accurate

measurement, has brought a new emphasis on teaching methods. These include case studies, seminars, the use of group dynamics and rôle-playing, and special uses of visual and aural aids. The need for adequate time for discussion of and quiet reflection on new ideas makes it specially advantageous for such courses to be held on a residential basis. This is already well known to major industries which have staff colleges or make use of adult education and other residential colleges. We may expect these courses to increase in the colleges of advanced technology as their new halls of residence become available.

Technical education and industrial training should make the most of the human ability available for the different levels of employment. At a time when expensive advertisements in the newspapers and technical journals almost cry aloud for qualified people, and when official reports in plenty have drawn urgent attention to the scarcity of trained ability, it is disturbing to find how much of the ability of the young people who start on our courses is wasted. Some pilot surveys<sup>15</sup> showed a serious situation, as for example when out of 100 students who sat the first year examination of the course, only 8 per cent gained the Ordinary National Certificate at the first attempt three years later, and only 3 per cent gained the Higher National Certificate in the minimum time of five years (Diagram 2, column 12). Taking into account all successes after previous failures, the proportions rise to about 15 per cent and 10 per cent respectively. The most optimistic figures are that, of those who start the course, one in 5 gains an O.N.C. and one in 7 gains an H.N.C. The causes are many and complex: defective schooling, lack of innate ability and difficult home conditions, adverse conditions at work, insufficient time in part-time courses, poor teaching, ill-health, travelling difficulties, personal attitudes, and so on. These first investigations have been followed up by inquiries made of the records of students in National Certificate and City and Guilds Courses in about 110 technical colleges by the Central Advisory Council for Education (England), under the Chairmanship of Sir Geoffrey Crowther. The Council has given very careful consideration to the whole matter, and their recommendations will form an important part of its forthcoming Report.<sup>16</sup>

The challenge in technical education is to turn potential wealth into actual achievement: in the widest terms this is as true of institutions as of the individuals who attend them. Students will generally do better in well-endowed institutions, which are purposeful, imaginative and creative in their work. These will encourage and inspire increasing numbers of students to accept a discipline of study and training, as prolonged as both must be to meet modern requirements. We may thus expect the failure rate in courses to improve as the four types of college become more clearly established and equipped for their specialist function. Their work is now being backed by the biggest building programme in the history of technical education: £85 million in England and Wales in the five-year period ending in 1962, and a further £45 million in the ensuing three years.

In this connection the emergence of the Colleges of Advanced Technology is therefore of singular importance to the future well-being of industry and to technical education. Since the eight colleges were designated by the Minister of

Education in 1956-7, they have mostly complied with certain conditions then laid down. The most important were: modified constitutions and powers of governing bodies, the shedding of certain courses (e.g., for craftsmen and technicians) not germane to their future function; new advisory committees; new building programmes including the provision of halls of residence, and the development of new courses, and especially of sandwich courses leading to the Diploma in Technology. Table IV shows how much progress they have already made in this respect.

Certain critically important matters, however, remain to be solved if they are to develop as 'university-quality' institutions concerned solely with work of high quality. The issues are difficult and complex, and cannot be dealt with here at length: but they cannot be ignored.<sup>17</sup> I must first of all combat the prevalent notion that these colleges have only just started on courses of degree standard, postgraduate courses and research: they have undertaken undergraduate work and postgraduate short courses for very many years, and some, notably Battersea Polytechnic, have successfully conducted research, some of it in close co-operation with industry. Nevertheless, in the first few years since their designation the emphasis has rightly been on establishing new undergraduate courses, especially sandwich courses for the Diploma in Technology, and in developing existing courses still further. They have moreover established close links with industry, though they would be the first to admit that these can be greatly strengthened and should be one of their outstanding characteristics. In the last session 1958-9, they enrolled about 7,750 students in full-time undergraduate courses, of which 1,899 were in Diploma Technology courses. In addition, about 19,000 students attended part-time courses, of whom over one quarter attended postgraduate short courses.

The next phase must be a much greater development of research and postgraduate courses, largely but by no means exclusively designed to meet the immediate or short term needs of industry. In this connection the proposed new award higher than the Diploma in Technology, the M.C.T.—Membership of the College of Technologists, being established by the National Council for Technological Awards, is an important development. This may be gained by holders of the Diploma in Technology, or university degrees, on the successful completion of an approved programme of work carried out jointly in industry and at a college. The programme may be concerned with any technological aspect of industrial activity—research, development, design, production or market investigation—and will be supervised jointly by staff of the firms concerned and of the college.

Important though this development is, there will be serious disadvantages if all or even most of this postgraduate work of the advanced colleges is to be based on it. Long-term research is vital to their well-being, and linked with this is the future of their science departments, such as those in chemistry, physics and mathematics. Over the last decade I have done my best to see sandwich courses established where they are applicable, but it is now almost a case of save us from our friends who see the sandwich course principle as a panacea for

technical education at both undergraduate and postgraduate level, as for science as well as technological courses. I am no less concerned at the excessive zeal of those who, desiring to establish the colleges of advanced technology as a distinctive type of institution undertaking only work of university standard, wish to make them so radically different as to have none of the fundamental characteristics of university institutions *per se*. Of these characteristics, governance, finance and academic autonomy are crucial, but time permits one only to make some illustrative comment on the matter of academic autonomy.

With the current expansion of university education, university colleges are being established and proposals are being actively considered on an unprecedented scale. In the modern pattern, initiated with the University College of North Staffordshire, the university college gives its own degree *de novo*, under the aegis of several established universities. This is an arrangement clearly designed to come to an end when the university college has grown to full stature. It will then give its own first degree and higher degrees and have full academic autonomy and responsibility. The colleges of advanced technology, which by contrast have long experience behind them, are still dependent on external recognitions such as those of the London University degree system, the National Council for Technological Awards (Hives Council) and the professional institutions, a dependence which appears all too permanent. It is not that these colleges expect to have no period in which to prove themselves, but that the opportunity to do so fully does not seem to be there. No greater incentive to their development could be provided than for this opportunity to be made clear at the earliest possible moment.

The problem is greatest in the conduct of research and postgraduate courses. These cannot develop fully without highly qualified staff, who will command the respect of industry and attract able students. Such staff will not come if they cannot foresee the time when the college has full academic autonomy, and the right to grant its own awards. This is not a wish slavishly to follow the established universities, and become the nethermost end of Redbrick. Nevertheless recent visits to Russia, Holland, Canada and the U.S.A. have brought all these considerations home to me with renewed force. It is an impossible task in these countries to try to explain when and why an institution devoted entirely to work of university standard is not and cannot be a university, when and why its first award is not a degree, nor even its own award, nor yet that it can ever hope to have its own award. The quizzical incredulous looks which greet such attempted explanations are yet another eloquent tribute to the lingering unacceptability of technology in this country as an academic discipline, which was so faithfully portrayed by Sir Eric Ashby in his recent book *Technology and the Academics*.

Apart from the major issue of the uncertain future of the colleges of advanced technology, progress in recent years has been encouraging. However, the future is still challenging throughout technical education as a whole. Repeatedly a twofold challenge is evident—

first, to create and foster a lively partnership of those engaged in industry and the colleges and,

secondly, to develop new ideas and teaching methods so that the needs of individual students at all levels will be fulfilled. Only through them can industry have a lasting basis for prosperity.

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### III. COMMERCIAL AND HIGHER PROFESSIONAL EDUCATION

by

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At the outset it is necessary for me to define the field of commercial and higher professional education. I am going to do so very loosely by saying that I assume it to include everything which is taught in a college of commerce, or the commerce department of a technical college.

Colleges of commerce have sometimes been referred to as monotechs. In fact, however, there is probably as much variety in the knowledge, techniques and skills taught in colleges of commerce as there is in technical colleges. Modern commerce uses a great number or variety of specialists—those who are engaged in market research, in marketing or organizing distribution, in advertising, as well as directly in selling, and others whose services facilitate production and trade, such as those engaged in banking and finance, to provide the capital needed for production and also the credit needed by traders and the means of payment between debtor and creditor. There are the specialists who do the accounting, the stockbroking and the company management. There are those who operate systems of transport, as well as those such as the shipbrokers, shipping and forwarding agents and exporters, who organize their use. There are insurers who specialize in bearing one or more of a number of different risks run by producers, traders and consumers. All these specialists use documents, for record and for communication. Documentation involves office work, and hence we have a number of specialists in different kinds of office work, as well as those who specialize in the management of offices.

All these specialists need in varying degrees three different kinds of qualification—skill, knowledge and managerial ability—for example, skill in the operation of machines, whether they be typewriters, accounting machines, card punching machines, calculating machines or computers, skill in sorting, in calculating, in writing, and in the use of language or languages for communication; knowledge of facts, such as the law, customs regulations, rates of exchange between currencies, conditions attached to different forms of insurance policy, possible sources of raw materials, characteristics of the commodities being bought or sold, or knowledge of organization, such as the general organization of the business world, the relationship of department to department, of firm to firm, of function to function, and managerial ability, or the ability to make sound decisions varying from decisions on elementary detail to decisions on major policy. My function in this lecture is to discuss the contribution which commercial or higher professional education makes or can make to the development of these skills, this knowledge and this managerial ability.

It is difficult to discuss modern commercial education without some reference



to the historical developments through which the present position has been reached. The commercial world as a whole is only now and slowly beginning to recognize the value of general commercial education, as opposed to training in specialized techniques and knowledge. It was not until the end of the nineteenth century that commercial education extended beyond instruction in book-keeping and languages. From the later years of the nineteenth century, however, education authorities, using that term in its broadest sense, have made continuous efforts, with limited success, to induce students and their employers to make use of courses of commercial education with a broad background as well as specialized techniques.

During the present century the dominating features of education for commerce have been, firstly, the importance attached to examinations and certificates, rather than to the courses of instruction upon which they were based, and secondly, the proliferation of associations calling themselves professional institutes or professional associations whose prime function in many instances has become the conduct of examinations and the granting of certificates and the right to place letters after one's name. The Carr-Saunders Committee, drawing attention to this latter development, said that at that date there were at least fifty professional associations of this character, whose professed objects were usually much wider, but 'most of whose energy is absorbed by the conduct of examinations for which annually there is a very large entry of candidates'. The growth and importance of examinations and the proliferation of professional associations seem therefore to have some connection. The Committee on Education for Salesmanship (the Goodenough Committee) in its second interim report, issued in 1930, says in reference to the domination of our education by examinations, 'in the countries visited, the examinations follow, rather than determine, the course of study'. The creation of new professional associations still continues, and most such new bodies continue to think that their first duty is to devise still another examination.

While it is undoubtedly true that professional associations have taken a prominent, if not a dominant, part in stimulating the demand for commercial education, and in controlling its direction, it is my belief that in recent years the vested interests which they have built up have been an impediment to its progress and development to meet modern needs. Happily, there are indications, to which I shall make reference later, that this position is changing, and that professional associations may play as important a part in facilitating the further progress of education for commerce as they played in its early development.

The very growth of professional associations may be due in part to another feature which has probably hampered education for commerce in the past. In Victorian days, trade or commerce was regarded as the occupation of those who lacked the education or breeding to enter one of the professions. The *Universal English Dictionary*, published in 1936, defines a profession as 'that which one professes or practises as a calling, specifically the learned or liberal vocations formerly sharply contrasted with trade or business though the distinction is rapidly breaking down'. What could be more natural, therefore, than

that those practising as a calling some specialized technique associated with commerce should try to acquire professional status, or, in the words of the Carr-Saunders Committee, 'come together, form an association, design a syllabus, conduct examinations, and admit to membership of the association those who pass a test of competence in the technique. This they do in imitation of the ancient professions though they may depart far from the conception of a profession as traditionally understood'. From the incorporation by Royal Charter in 1880 of the Institute of Chartered Accountants, the rise of such professional associations has been very marked. The Carr-Saunders Committee found that there were more than fifty in the commercial field in 1947 and many more have since been formed.

Such associations maintain their status through the imposition of examination tests, but they also impose conditions as to general education and business experience, which may exclude many who are in fact practising the calling or desire to do so. This has given rise to the growth of other associations covering the same function, or some slight variation from it, but with easier conditions of entry. In the course of time some of these have been absorbed or amalgamated, but usually this has only resulted in the establishment of still other associations to provide the easier conditions of entry. We have arrived, therefore, at a position which is perhaps best illustrated in the field of accountancy, where in addition to the Institute of Chartered Accountants, the Society of Incorporated Accountants, now amalgamated with it, and the Association of Certified and Corporate Accountants, which are recognized under the Companies Acts, we have:

- The Institute of Company Accountants,
- The Association of International Accountants,
- The Anglo Society of Accountants and Auditors,
- The Society of Commercial Accountants,
- The Faculty of Auditors,
- The English Association of Accountants,
- The British Association of Accountants and Auditors,
- The Association of Practising and Commercial Accountants,

and in a slightly different field, the Institute of Cost and Works Accountants, and the Incorporated Association of Cost and Industrial Accountants. This is an extreme example, but a similar situation is to be found in other fields of activity, and there is nothing to stop any person or group of persons from establishing a new body, devising an examination, and telling those who pass it that they may put certain letters after their names. It is therefore not to be wondered at that the older associations with the stiffer conditions of entry have been reluctant to relinquish control over any detail of their examinations, and have feared that co-operation with any outside body might result in infiltration of people not measuring up to their standards and therefore to a lowering of their status. Even though this situation is regrettable from some points of view, it has been brought about by the widespread and growing desire for some certification of knowledge and competence in the performance of various commercial functions, and it has encouraged study, although it may not have done

so in all cases upon the most desirable lines or by the most desirable methods. The present-day influence of the professional associations may be indicated by the following figures for 1958-59. The Institute of Chartered Accountants, the Association of Certified and Corporate Accountants, the Institute of Cost and Works Accountants, the Chartered Institute of Secretaries, the Institute of Bankers, and the Chartered Insurance Institute had between them approximately 93,000 members of the student grade, and 60,000 examination entries. These figures relate to the United Kingdom only, and exclude overseas candidates. The examination entries involve some duplication because, in most cases, the associations have two examinations a year, and students failing at the first examination will have entered again at the second. Nevertheless, these are very large figures, particularly when we bear in mind that they relate only to six of the more than fifty associations to which the Carr-Saunders Committee made reference.

Students prepare for these examinations in a variety of ways, but although exact figures are not available, it is more than probable that the majority of them prepare by means of correspondence courses. Most chartered accountants have, up to now, encouraged their articled clerks to adopt this method of preparation in preference to attendance at classes in colleges of commerce. The Institute of Bankers, on the other hand, encourages students to attend classes. Even so, it is estimated that only about 40 per cent of their examination candidates do so. It therefore appears that associated with the importance of the professional associations is the predominance of study through correspondence courses. Of those who receive oral tuition in commercial colleges or commerce departments of technical colleges, a very high proportion do so by attendance at evening classes at the conclusion of their day's work. For example, the City of London College, which probably has more students preparing for such examinations than any other college in the country, has over 7,000 evening students, compared with about 350 part-time students in the day-time.

All these professional associations were set up to cater for those who were following specialized callings within the commercial field. A few years before the First World War, education authorities began to recognize the need to provide commercial education for those who were either not following one of these specialized callings, or who wanted a broader view of the commercial field. This resulted in the establishment in evening institutes, first in the north and later in London, of the grouped course system, the purpose of which was stated by the Board of Education in a Circular issued in 1919 as being to enable the student to realize the nature of his work in which he was taking a small and specialized part and to train him in the power and habit of thought in relation to business. The same purpose was behind the establishment in 1935 of endorsed certificates in commerce, awarded by approved colleges and endorsed by the Board of Education, after a three-year course of part-time study. In 1939 they became the National Certificates in Commerce, administered by a joint committee of the Board of Education and the Association of British Chambers of Commerce. Ordinary National Certificates in Commerce were awarded after

a three-year course of part-time study and Higher National Certificates after a further two years. In 1950 the scheme was changed; the composition of the controlling body was broadened by the inclusion of representatives of some fifteen of the professional associations as well as of the Ministry of Education, and of commercial and technical colleges. The Ordinary National Certificate became a two-year course and the Higher National Certificate a three-year course. These changes were the outcome of the recommendations of the Carr-Saunders Committee, but neither the Endorsed Certificates in Commerce nor the National Certificates in Commerce have attracted a substantial number of students.

The education authorities, however, were not alone in recognizing the need for a broad understanding of the commercial world and commercial techniques. Professional associations recognized that education and training narrowly restricted to a specialized occupation was not enough, and most of them introduced into their intermediate examinations subjects of a much broader character. Thus we find most of them including book-keeping or principles of accounts and the general principles of law or commercial law. Many of them also included other subjects such as economics, English, and commercial geography. Although in most cases their members had no claim to specialized knowledge of these general subjects, nor had any experience in teaching them, each professional body drew up its own syllabuses irrespective of those in the same subjects already drawn up by other bodies. Thus there grew up a variety of syllabuses in the same subjects, which, although they covered broadly the same ground as each other, varied in detail and emphasis. Students tend to be interested in passing the examinations rather than in study of the subject, and in consequence demand instruction narrowly concentrated upon the syllabus of the particular examination for which they are working. This has militated against the provision of class instruction, and has led to the establishment and use of correspondence tuition, often of a narrow, cramming variety. When the National Certificate scheme was revised in 1950 it was hoped that, since representatives of professional bodies had control of its standard, the professional associations would increasingly be prepared to grant exemption to students who had taken the Ordinary National Certificate in Commerce in subjects required for the professional bodies' own examinations. Progress up to now in this direction has, however, been extremely slow.

In 1947 the Special Committee on Education for Management (the Urwick Committee), recommended the establishment of courses of study leading to an examination for the award of Intermediate Certificates in Management Studies, and subsequently to Diplomas in Management Studies. The Intermediate Certificate in Management Studies is of particular interest to us in considering education for commerce because six of the nine subjects were those that had come to be regarded as the core of basic knowledge required for higher education for commerce, and were generally to be found in national certificates in commerce. In drawing up their syllabus for what the Urwick Committee called the common intermediate examination, the Committee had in mind the hope that

the professional institutions would in large measure adopt it in place of their own. So far as the professional associations which we have been considering are concerned, this hope was not realized. The Intermediate Certificate in Management Studies has had little more success in this respect than the National Certificates in Commerce, although it has proved more attractive to students as a certificate of value in itself, probably owing to the inclusion of the word 'Management' in its title. There are those who believe that one of the steps towards success of the National Certificate in Commerce should be to change its name.

This then is the nature of commercial education in this country above the routine or elementary level. Let us now consider briefly how provision is made for it by our public educational institutions.

There are 15 colleges of commerce and over 170 commerce departments in technical colleges. There are also 20 evening institutes or their equivalent, which provide advanced courses in commercial subjects in the evenings only. In the competition for the scarce building and financial resources which have been available since the war, education for commerce has received low priority. Despite the resultant unsatisfactory accommodation and inadequate staffing, they have developed rapidly both in size and in the variety and quality of the facilities which they have offered. Fortunately, there now appears to be a public awakening to the importance of developing still further our education for commerce.

One of the early signs of this awakening was the establishment in 1957 of the Advisory Committee on Education for Commerce (the McMeeking Committee). The McMeeking Committee was widely representative of industry, commerce, the professions and education, and I cannot do better than draw attention to some of its recommendations and comment upon the circumstances which gave rise to them. I do not propose to list them all, since they can be studied in detail in the report itself. Several of the recommendations hinge upon the belief that a combination of theoretical study with practical experience is the best form of education for a great many of those who are to occupy the middle and higher ranks of commerce. The Committee recommends the development of commercial apprenticeship schemes, which involve organized training on the job combined with release during working hours for the study of theoretical aspects in colleges of commerce. This may be by release to the college on one day or its equivalent in each week, or by what is termed 'block release' for full-time attendance at a college for unbroken periods of four to eight weeks at appropriate points in the trainee's practical experience, or by sandwich courses in which longer periods of up to six months are spent alternately at a college and in practical commercial employment. These recommendations were made in the belief that they would facilitate the provision of more effective education than is possible when we rely as extensively as we do upon evening study at the end of a day's work. Already many of the more progressive firms have devised schemes of training on the job for their new recruits and have co-operated with their local college of commerce in relating their college studies to their business experience and likely future needs. Consequently, suitable courses of study in the day-time are already available in a growing number of areas.

Other recommendations are concerned with National Certificates in Commerce, and their relationship to professional qualifications. Behind these recommendations lie two beliefs: first, that it is increasingly important for those engaged in specialized functions in commerce to be able to understand how their functions fit into the whole, and therefore to have a broad understanding of the whole field of commerce; second, that the rapidity of change in this modern world makes it desirable that young people entering commerce should not have to choose their ultimate specialization at too early an age, and that their re-training for some other function should be possible without starting again at the beginning if their circumstances or the changing needs of commerce so require. The Committee therefore recommends that the joint committee responsible for the control of national certificates and the professional associations shall co-ordinate their earlier examinations so that those entering commercial employment may proceed along agreed lines of study from which they may diverge along whatever line of specialization seems desirable when their direction has become clear to them. It also commends the Higher National Certificate in Commerce as a desirable qualification covering both general and specialized commercial knowledge especially in those fields where no precise professional qualification already exists, and they recommend the establishment of an additional national award of a standard equal to that of a university degree to mark the completion of a sandwich course in general commercial studies. The Committee had in mind here something equivalent to the Diploma in Technology, which already exists.

Here again, progress has already occurred. A number of progressive firms have decided to use ordinary national certificate courses for the earlier years of their commercial training schemes and the higher national certificate as an alternative to professional qualifications at the higher level. Two colleges of high repute have to my knowledge also established courses leading to a College Diploma in Commerce with a higher standard than the National Certificate in the hope that the proposed new national award will be established and applied to them. The prospectus of one of them states that the course has two purposes: to impart a broad general knowledge of commercial organization and methods and the principles underlying them, and the intellectual development of the students to enable them to analyse problems, find information for themselves, select and present it.

Other recommendations relate to the kind of education provided by the colleges of commerce. More emphasis on preparation for export marketing is proposed, and alongside this go recommendations for more serious study of foreign languages with special reference to their use in the conduct of foreign trade. More short refresher and conversion courses are suggested both to assist small and medium-sized firms in adjusting themselves to modern conditions by bringing up to date their knowledge of business practices and techniques, and to give training to technically qualified men for salesmanship and marketing in view of the increasing need for those who are engaged in selling to have a sound knowledge of both technical and commercial factors.

This is only one direction in which short courses may be desirable. This is



an era of rapid change, and in such times, senior business men can easily get out of date. There is consequently a growing need to make it possible for senior executives or even directors of business to attend courses in order to be brought up to date on latest developments. One has only to look at the prospectuses of colleges of commerce or the Bulletin of Advanced Courses issued by the Regional Advisory Councils to see that this need has not been overlooked by those responsible for our colleges. May I quote a few such courses picked at random from a number of different prospectuses: management accounting, organization and method, work study appreciation, marketing practice, measuring advertising effectiveness, sources of economic information, cost and financial control, industrial statistics and quality control, operational research and the scope of electronic computers, taxation in relation to company reconstruction and reorganization, seminars on problems of tanker operating, the common market and the Stockholm plan; export seminars, in which trade representatives from the embassies of the Soviet Union, Germany, Sweden, the United States, and Brazil discuss with sales managers trade possibilities in their own countries; trade with the Soviet Union, a nine-weeks full-time course combining an elementary study of the language with general background knowledge about Russia and trading conditions and methods; the commercial aspects of marketing a product, a three-weeks full-time course designed for sales representatives. For many of these courses outside specialists are used, but in many of the colleges senior teaching staff have been making special studies of the latest developments in their own techniques or spheres of knowledge, and are able to give some or all of the lectures or lead some of the discussions.

This brings me to the recommendations relating to the relationship between the staff of commercial colleges and the business world. Here, it seems to me, lies the key to future development. When the McMeeking Report was published, *The Times* published a leading article headed 'Apathy in Commerce', and in the course of that article, the statement was made, 'what is lacking in commerce is the conviction that training is necessary or even helpful. How can the apathy be overcome? Colleges must be more compelling in describing to industry their training facilities.' The majority of business men are amazingly ignorant of what colleges of commerce can offer, and since so many of our senior business men have had to learn on the job and grow up with the job they are apt to be sceptical about commercial education having anything at all to offer. The position is summed up in a note in *Barclay's Bank Review* for May, 1959, commenting upon the McMeeking Report, where it says 'about one quarter to one third of the working population are engaged in commerce. It is a highly relevant question to ask how all these people have been trained for their work, but it is sad to record that to some extent education for commerce has been a Cinderella in comparison with education in the sciences and technology. Learning on the job is of course of great importance, but it is not enough, particularly in an industrial and trading community.' Thus it is not surprising that one of the recommendations of the report is that more should be done to publicize the facilities colleges have to offer. One method suggested is that more personal



contacts should be developed between college principals and heads of departments and business organizations in their locality. I am inclined to agree with a prominent Midland industrialist whom I heard talking recently on this subject, when he said, 'colleges have got to do the job, and the job includes hard selling', and the selling has got to be done to the senior executives, many of whose education for commerce was acquired through correspondence courses which enabled them to pass their examinations but which gave them no idea at all of what a college of commerce could do, even in those days, far less what modern facilities they now provide. It may be, therefore, that our first job ought to be to get the senior executives themselves into the colleges for severely practical courses which will help them to bring their knowledge and techniques up to date and to learn how other firms and businesses are being conducted. I have already indicated that many short courses of this character are already being offered by colleges of commerce in the commercial centres of the country. It may be also that in some of them much more use of the case study method on which the Harvard Business School relies so predominantly will have to be developed. The building up of cases and the acquisition of knowledge for lectures calls for considerable expenditure of time by the teaching staff of the colleges in visiting and working for business undertakings. In doing this they will not only benefit their teaching and be able to relate it more easily to current problems, but may also help the firms they visit by acting as consultants to them.

In addition to persuading senior business men to attend courses of lectures or seminars using the case study or other appropriate methods, the McMeeking Committee suggests that they should be induced to bring their business problems to colleges of commerce for discussion with the college experts or with other similarly placed business men at meetings of discussion groups. There are two colleges known to me where arrangements of this character have already been made. In one case it takes the form of a management association, mainly peopled by those who have been through management courses at the college, and in the other case it takes the form of a discussion group with provision for bringing in experts on the college staff or outside experts to deal with problems posed by members. In still a third college a group of senior teaching staff with suitable professional qualifications have constituted themselves into a consultancy group to carry out an investigation into the possibilities of more profitable use of their capital by a firm in the neighbourhood which has approached the college for this purpose.

The report also recommends that the staff of colleges should be encouraged to study commercial education and commercial practice abroad, and it suggests the appointment of business historians to the staff of colleges so that they may study the history of individual businesses in order to reveal the possible causes of their success or failure, or of fluctuations in their fortunes. Such revelations may be of help to other firms in determining present policy. This recommendation has already been acted upon. It is, of course, only so far as this research into practical business problems is translated into teaching that the basic function of the colleges will be fulfilled, but it is precisely this kind of teaching which will

be of benefit to the more senior personnel in business undertakings, and if they find that the work of the colleges is of practical help to them in the conduct of their business they will see to it that their younger staff attend the colleges for appropriate courses in which the basic disciplines, principles and knowledge can be taught.

Earlier in this paper I suggested that there were signs that the traditional attitude to education for commerce was changing. In closing, it may be appropriate to review some of these signs. Probably the right starting point is the issue in February, 1956, of the Government White Paper on Technical Education. Although this paper was concerned almost entirely with technical, as opposed to commercial, education, it was the first public document for many years to recognize the importance of commerce and education for it. In paragraph 9 of the introduction, it stated, 'the range of technical education goes far beyond the study of materials and mechanics. Accountancy, costing, salesmanship, commercial skills of all kinds, including foreign languages, are equally important to a great trading nation. Full employment brings new problems which are more likely to be soluble the wider is the understanding of how our economy works. Such subjects as economics, business management, wage systems and human relations must now be given more prominence.' Just over a year later, the Minister of Education followed this up by asking the National Advisory Council on Education for Industry and Commerce to give its attention to the problem. The establishment of the McMeeking Committee was the result. Its report was published in March of this year, and wide prominence was given to it in the national press, with almost unanimous acceptance of the value of education for commerce, and its importance in maintaining our world trading position.

In the meanwhile, at the beginning of 1958, the Federation of British Industries took the initiative in setting up a working party to 'survey broadly the facilities available for assisting firms in the development of their export trade with a view to identifying any gaps, e.g. in education and training facilities for sales and other staff, and to recommend any necessary action'. This committee had as its chairman Sir Cecil Weir, and its report, published about one month after the McMeeking Report, entitled *Export Trade Facilities*, has become known as the Weir Report. It contains a whole section of 29 paragraphs devoted entirely to education and training for export management and marketing, and makes a number of recommendations for more active participation by exporting firms in the education and training of their marketing staff.

Although the Federation of British Industries took the initiative in setting up this working party, many of its members were drawn from outside the F.B.I., but the F.B.I. has now established its own working party to consider both this report and the McMeeking report and to recommend action upon them.

The British Association for Commercial and Industrial Education, another body largely composed of representatives of industrial and commercial firms, has also set up a working party to consider the McMeeking Report and the action which ought to be taken upon it. Even before the McMeeking Committee

got to work, the Association of British Chambers of Commerce had, after long deliberation, produced a scheme of commercial apprenticeship for training, both on the job and at commercial colleges, of young entrants to commerce. This scheme, details of which were published as an appendix to the McMeeking Report, is being adopted by an increasing number of business firms throughout the country. Still other firms are setting up commercial apprenticeships, although not actually adopting the A.B.C.C. scheme.

Another sign of the increasing recognition of the importance of commercial education was provided in 1957 when the British Iron and Steel Federation devoted its annual training conference to this topic. Again, a number of the larger industrial undertakings in the country, including oil and chemical companies, and the nationalized industries, have been giving a great deal of thought to the production of a scheme for general education for commerce which will suit the needs of such larger undertakings.

Amongst the professional associations also there is awareness of the need to re-assess their educational requirements. The Institute of Chartered Accountants has established a committee to review training for their profession, and this committee has already met for many days and taken evidence from large numbers of individuals and organizations. The Advertising Association, the Chartered Insurance Institute and the Chartered Institute of Secretaries also are reconsidering their schemes, although not in such a wholehearted manner; and representatives of these and many other associations are already in consultation with the Joint Committee for National Certificates in Commerce to try to find a way of co-ordinating their examination requirements as recommended by the McMeeking Committee.

All these are indications that the importance of commercial education is now recognized by many of those engaged in business. On the educational side, there is no less growth of activity and interest. The Minister of Education in a circular issued in June to local education authorities and principals of colleges declared that the McMeeking Report was of first-class importance and, with one minor reservation, he accepted the report in its entirety. This, I believe, is the first occasion on which a Minister of Education has formally accepted a report on education for commerce. The principals of colleges and heads of departments on their part assembled in large numbers at the commencement of the summer vacation and spent three days discussing the report and the action which they might take on it.

All this interest leads me to believe that we may well be on the eve of developments in education for commerce on a scale that we have never before known which may put us ahead of our commercial competitors in America, in the European Common Market, and the 'outer seven', and enable us as a country to play the same leading part in world commerce that we have played in the past; but this will only come about if the interest is translated into concerted action by all concerned.

## GENERAL NOTES

## NOTABLE LONDON EXHIBITIONS

An exhibition of water-colours, drawings and engravings by M. André Dunoyer de Segonzac has long been overdue here, and the present collection which fills the daunting salons of the Diploma Gallery at Burlington House with surprisingly little sense of monotony, will have consolidated the reputation of the Academy's honorary member before his exhibition closes on 29th November. It covers, in fact, the whole of the artist's working life and, while mainly drawn from collections in France, it includes two water-colours graciously lent by Her Majesty the Queen, which were presented to her by the President of the French Republic on the occasion of her Coronation. The gift was a fitting one seeing that Segonzac, though belonging to that generation of the school of Paris which effected the radical changes in the painting of our time, has remained consistently loyal to tradition.

The keeper of prints at the Bibliothèque Nationale (which mounted a similar exhibition of Segonzac's last summer in Paris) reminds us in the catalogue that the artist's abiding passion for river scenes derives from his childhood memories of a little flashing tributary of the Seine at Boussy-Saint-Antoine, where he was born in 1884. While it is the incomparable lightness and spontaneity of some etching suites which continually refresh the eye in this exhibition, it is the substantial water-colour landscapes about Provence and the Ile de France which give it strength, and also illustrate how much more happily Segonzac handles this medium than his oils, which are prudently omitted from the selection. At the same time, his unerring feeling for the *genius loci* is exemplified here in a prospect of the apse of Notre Dame, in tones of blue-grey and biscuit relieved by the heavy greens of foliage, which conveys the cloistered calm of the Ile oppressed with time.

In these large water-colour landscapes, with a body to them that one associates with a painter in oils, the dense richness of the colour serves a structural purpose. The initial drawing may be barely more than a scribble of scratchy indian ink lines. Substance is given by washes, more precisely by *puddles* of lucid colour which establish the surface of shadowed water, and are built up in layers without loss of freshness to bring out the denseness of wooded slopes or the solidity of riverside buildings.

Even so, it is as an etcher and illustrator that Segonzac is most captivating. What strikes one particularly is his ability to conceal, with something like Whistler's delicacy and adroitness, his very tentative grasp of the human form, actually turning flimsiness to advantage when the purpose of his drawing is to convey the speed of a cyclist, the leap of Nijinsky, the fragility of a young girl in illustration of Ronsard's sonnets, or more triumphantly still, the partial dissolution of his forms in light, whether it be a straw beehive or his friend Colette's veranda, exquisitely indicated direct on to the copper plate. Almost all Segonzac's etchings are, indeed, drawn direct from life *en plein air*, and one can only marvel at his feather-light certainty of line and cross-hatch, at the tremor of leaves and transitoriness of light, realized in these somewhat fragmented impressions. The etching suites culminate in the illustrations for the *Georgics*, the products of twenty years of passionate absorption in Virgil, which appeared in 1947 to take their place as one of the finest illustrated works of the century.

Another exhibition of absorbing interest, more especially to students of the modern revolution in art, is the collection of paintings produced in Germany during the years 1905-25, entitled 'Art in Revolt' at the Marlborough Gallery, which remains on view until 10th December. The political upheavals following two World Wars have obscured the achievement of German expressionist art until quite recent times; and it was the exhibition sponsored by the Government of the Federal Republic of Germany at the Tate Gallery three years ago which gave many English visitors their first opportunity to 'tune in', not without difficulty, to the emotional emphases

underlined by the harsh angular distortions and emotive colour of a generation of artists in revolt. The present exhibition in Bond Street, arranged by Professor Will Grohmann, brings out even more strongly the international character of this confluence sharing an uneasy apprehension and desire for change. With Hitler's ascendancy in 1933, the exodus of some conspicuous foreign settlers began, and a few years later their expressive art was being reviled for its 'degeneracy' in the memorable Munich exhibition, with samples of Nazi taste shown as a corrective.

What gives this collection its peculiar bite and bitterness is the contribution of the artists of *Die Brücke*. Along with the savage distortions of Kirchner or Heckel goes a strange emotive use of Fauvist colour which can make the reds and yellows flare like tongues of flame. The mood of Müller's *Couple in Love* is as utterly compassionless as Nolde's burlesque of two wantons sporting in a saint's embrace. Yet image after image stays in the memory for the passionate immediacy of the message it embodies, callous as that may be.

The colour, varying in intensity from jewel to flame, gives a homogeneity to the various experiments of the *Blaue Reiter* artists. Kandinsky and Jawlensky both arrived from Russia with vivid memories of their folk and church art; and the blazing arabesque which Kandinsky entitled *Paradise* in 1909, is as haunting, in its way, as the opulence of Jawlensky's colour combined, in his almond-eyed women, with the formation of Russo-Byzantine religious art. But the collection as a whole, which includes the expressive sculptures of Barlach, and groups of paintings by Kokoschka and Feininger, is primarily a revelation of the problematic condition of Europe manifested with a mystical fervour.

NEVILLE WALLIS

## COUNCIL OF INDUSTRIAL DESIGN ANNUAL REPORT

'Technical education in industry without visual education merely makes the production of ever greater numbers of ever uglier things a certainty. The growing pace of scientific and technological research will make it difficult in the immediate future not to get further out of step, unless there is a much greater awareness of the importance of the humanities'. This prophecy is taken from Sir Gordon Russell's Foreword (the last he will write as Director) to the recently published 14th annual report of the Council of Industrial Design, which may be read as the complement of the Cantor lectures published in this issue of the *Journal*.

Sir Gordon is concerned to expose the still widespread misconception that the Council's existence is alone enough to banish ugly goods from the shops. 'To improve design standards in industry', he writes, 'it is . . . essential for the client—in this case the manufacturer, the retailer and the public—to know what the designer is up to and to have some sympathy with his aims'. It is in maintaining a channel of communication between the designer and his hydra-headed 'client' that the great value, both commercial and cultural, of the Council's work resides. The public interest indicated by the attendance figures at the Design Centres in London and Glasgow shows, in Sir Gordon's words, that 'people are beginning to use their eyes to criticize for themselves and to make up their own minds'; whilst, in the past year, the number of requests from manufacturers for the services of designers recommended by the Council suggests a steadily developing industrial interest and policy. Of the client-in-the-middle, Sir Gordon writes that, though there are notable exceptions, 'it does seem to be true . . . that the taste of the average member of the public is ahead of that of the average retail buyer. . . . This is a situation which will undoubtedly right itself when firms see they are losing business by not showing better-designed goods. A considerable advance could be made if more selective exhibitions could be taken to provincial towns. . . .' In the body of the report are recorded some of the steps already taken in this direction. In September, 1958,

a version of the Design Centre was erected in a leading store in Newcastle-upon-Tyne, where it was visited by more than 50,000 people. Since 31st March, 1959 (the term of the Report) comparable displays have been mounted in stores in Cardiff, Southampton and Manchester. Another effective means of encouraging a discriminating taste has been the growth of the Council's labelling scheme. By this scheme any manufacturer may affix a specially designed label to those of his products which have been exhibited in the Design Centre and are still accepted for Design Index. By the end of the year covered by the Report, 284 manufacturers had ordered over three million such labels and these distinguishing marks were beginning to appear in shops up and down the country.

Amongst other major developments noticed in the report is the extension of the Council's work in Europe and the Commonwealth—and the consequent stimulation of the export trade—also by means of representative exhibitions. Two more of these overseas displays have been announced since the report: 'The Design Centre Comes to Ghana', organized jointly by the United Africa Company and the Council, opened in Accra on 16th November (the original suggestion for this venture was made by the Ghana Parliamentary Delegation after a visit to the Design Centre in June of this year), and on 20th November, 'British Design', an exhibition of some 500 well-designed British products, opened at the Museum of Modern Art in Copenhagen under the patronage of Her Majesty the Queen, and of His Majesty the King of Denmark.

#### OPEN COMPETITION FOR THE ASCOT CUPS 1960

The Queen has authorized the Goldsmiths' Company to announce an open competition for designs for the Ascot Race Cups to be awarded in 1960.

The competition is open to all designers of British nationality. There are three separate cups: the Gold Cup, to cost £500; the Queen's Vase (in silver-gilt), to cost £250; and the Royal Hunt Cup (also in silver-gilt), to cost £200. The funds mentioned are provided by the Ascot Authority and are intended to cover the cost of manufacture and supply, including any purchase tax. Designs should be original but have due regard for tradition. The Royal Arms should be included in the design for each cup and must not be varied from the prescribed style, examples of which may be obtained from the Clerk of the Goldsmiths' Company.

A sum of £500 is provided for prizes, and if the judges consider that the designs entered reach a sufficiently high standard, the three winning designers will probably each receive £100 and the remaining £200 will be awarded to other competitors.

Those who would like to enter the competition should first obtain full details of it from the Clerk of the Goldsmiths' Company at Goldsmiths' Hall, Foster Lane, London, E.C.2. Entries must reach him before 13th January, 1960.

#### PROPOSED CHARLES II RESTORATION EXHIBITION

*The Express and Star*, Wolverhampton, an evening newspaper circulating in Staffordshire, Worcestershire, Shropshire and parts of Warwickshire and Herefordshire, is considering the sponsorship of an exhibition in May, 1960, to commemorate the tercentenary of the restoration of Charles II to his sovereign rights.

In Shropshire and Staffordshire there still exist a number of the houses at which the King—then in the third year of his true reign—took refuge after the Battle of Worcester in 1651. It is hoped that treasures from these houses, together with relics of Charles's flight and escape, and furniture, fabrics, silverware, coins, jewellery, etc., associated with the Restoration, will be included in the exhibition. The sponsors are anxious that the exhibits should be both authentic and of the widest variety, and they have consequently issued an appeal to those who possess objects of the kind described, or any other items of interest, to lend them for the display. Fellows of the



Society who would consider responding to this appeal are asked to get in touch with Mr. J. Corbett at *The Express and Star* office, Queen Street, Wolverhampton.

Support for the principle of the exhibition has already been promised by several persons of consequence, including Her Majesty's Lieutenant for the County of Stafford, the Earl and Countess of Bradford, and the Dean of Lichfield.

#### STUDIES IN THE SOCIETY'S ARCHIVES IX

##### JOSEPH BRAMAH\* AND HIS FAMILY AS MEMBERS OF THE SOCIETY, 1783-1845

The archives of the Society provide valuable evidence of the way in which its original aims, the promotion of arts, manufactures and commerce, have been steadily pursued through two centuries. But there is another aspect of its work and influence to which attention has not, perhaps, been fully drawn, and that is the education of its members by contact and discussion with men having leading positions in their respective profession or calling. It has been well said that the Society welcomed young men to membership at the beginning of their career, not as a reward for distinction already achieved, and that the Society had a formative influence on their subsequent development and in the contribution which they were ultimately able to make in every branch of art, industry and commerce.<sup>1</sup> A typical example of this influence at work can be found in the history of the membership of Joseph Bramah, famous as the inventor of the Bramah Lock, of the Hydraulic Press and of sixteen other valuable inventions of the greatest practical importance in the field of engineering and industry.<sup>2</sup> Joseph Bramah arrived in London about 1773, as a youth of 23, having walked the 160 miles from his father's farm at Stainborough near Barnsley, Yorkshire. Since he had already served his apprenticeship with a local carpenter, Thomas Allott, he soon found work in London as a cabinet-maker, and his rise in the social and professional scale can be traced from the addresses given in the series of patents, eighteen in all, which he obtained between 1778 and 1814.<sup>3</sup> However, of his life in London very little was known until a close search through the minute books of the Society of Arts enabled some light to be thrown on his activities and acquaintances there.

Joseph Bramah, described as a cabinet-maker, of Denmark Street, Soho, was elected a member of the Society on 29th October, 1783, at the age of 34, his sponsors being Dr. Alexander Johnson, Valentine Green, the engraver, and a Mr. Sheldon.<sup>4</sup> Amongst the other members elected that day were the Duc de Chaulnes, the scientist, and William Brummell, private secretary to Lord North and father of Beau Brummell. Bramah was primarily interested in mechanical engineering, and it is to the minutes of the Committee of Mechanics that we naturally turn for records of his activities in the Society.

In his first year of membership, Bramah was present at ten of the fortnightly meetings of that committee, his first appearance being on 27th November, 1783, when he immediately found himself engaged in the consideration of a new lock, submitted by a Mr. Marshall. This was of special interest to him, as his first patent for the Bramah Lock was taken out only a few months later, in April, 1784.<sup>5</sup> At a meeting on 18th December, 1783, a lock-smith, appointed by the Society, had spent an hour and a quarter trying to pick Marshall's lock, but had then declared he could not pick it. In the words of the minutes: 'Mr. Bramah having also had an Opportunity of examining the Lock and Key made two Instruments in form of the Key by which he opened the Lock in about a quarter of an Hour, although the Inventor had said no one could make an Instrument to open it, notwithstanding he might be in possession of the Key'.

As is sometimes the case in comparable circumstances to-day, the enthusiasm of the new member proved short-lived: Bramah's attendances at meetings of the Mechanics

\* In 1949 the Society held an exhibition to mark the bicentenary of Bramah's birth. See *Journal*, xcvi (1949), p. 569.



Committee fell from ten in the first year to six in the next year, and to three in 1785-6. His interest was renewed in 1786-7, when he attended nine times. His last reported attendance was on 14th February, 1811, and his total up to his death in 1814 was fifty-five. The mere record of the dates of his attendances enables us to know that he must have been in London on those days, information which is of value in tracing his movements through the years.<sup>6</sup>

The question of the prevention and control of fires was very much in the minds of the members of the Society at that time, and, as he patented his fire engine in 1793, Bramah must have been keenly interested in this subject.<sup>7</sup> He was present at several meetings of the Mechanics Committee when fire engines and extinguishers were considered, and on 5th March, 1795, it is recorded that 'Mr. Bramah being present obligingly offered to furnish an engine at the trial, if the Society judge proper to order one to be made, and to apply to it a contrivance whereby the powder may always be kept equally mixed with the water'. There is no further reference in the minutes to the result of these trials with foam materials.

On 14th February, 1811, the minutes record that 'Mr. Bramah attended and declared to the Committee that Mr. Smart's and Mr. Whibley's machines (for cutting oak staves) were infringements upon his patent. The Committee referred to a specification of his patent, dated 30th October, 1802,<sup>8</sup> for mechanisms producing straight, smooth and parallel surfaces on wood and other materials inserted in the repostery'. This was in connection with trials of planing machines at the Ordnance Wharf, Westminster Bridge, where there had been complaints by the wood-working mechanics at the substitution of Quebec Oak for Baltic Oak in the making of staves, on the ground that the former was a harder wood. It was decided that Smart and Whibley's machines were constructed similarly to others already known to the public and not therefore worthy of reward.

Amongst other subjects in which Bramah would most certainly have been interested in the meetings he attended were cranes for dock wharves, presses and wheeled carriages. He took out patents for wheeled carriages in 1809 and 1812.<sup>9</sup>

Bramah died on 9th December, 1814, and a tribute to his memory was paid by Thomas Hoblyn in a letter to the Secretary of the Society of Arts dated 25th November, 1815, in which he refers to 'the late Joseph Bramah, in whose recent death the public have lost a most valuable member of society: but he has left behind him a monument of inventions which must preserve his ingenuity and talents in the recollection of all those who had the pleasure of his acquaintance.'<sup>10</sup>

Amongst those who were acquainted with Bramah on the Committee of Mechanics were the best known engineers of that great period of English engineering, including such men as Marc Brunel, Thomas Telford, Henry Maudslay, Bryan Donkin, Charles Holtzapffel, Robert Fulton, Joseph Clemen, John Cuthbert, Alexander Nimmo, James Ryan, Joseph Field, John Fisher, and many more. How welcome would be a record of the conversations of these men as they gathered in the rooms of the Society.

Joseph Bramah's three sons were privileged to carry on his association with the Society for thirty years after his death. On 5th April, 1815, his eldest son Timothy, described as 'Engineer of Piccadilly', was elected to the Society. He became a life member in May, 1820, and his name is listed in the *Transactions* until his death, which was on 21st October, 1838.

On 14th December, 1815, Timothy attended a meeting of the Committee of Mechanics. The chief matter under consideration was an improved method of cleaning rice which Thomas Hoblyn had put into practice in Ceylon. Hoblyn had used a mill constructed by Henry Maudslay and an apparatus for making oil 'constructed by the late Mr. Joseph Bramah'. For some strange reason, connected, perhaps, with subsequent claims of the Maudslays relating to the origins of the Bramah Press, this reference to a press for oil-extraction has been crossed through in

the Minute Book. It is still possible, however, to read it through its crossing out, and it was afterwards published in the *Transactions* for 1817, together with Hoblyn's tribute to Joseph Bramah which has already been quoted. Bramah's press was also used by Hoblyn for extracting oil from coco-nuts, and in this connection it was described and illustrated in the same volume of the *Transactions*.<sup>11</sup> A telling instance of the Society's work in the communication of ideas occurred when the description of the press fell into the hands of an oil-mill owner of the Free City of Bremen in the German Confederation. Two presses were ordered from the firm of Bramah and, in 1829, Timothy Bramah communicated the satisfactory results of the order to the *Transactions*. For this communication and for another, made in 1831, on the less pleasant topic of prison tread-mills, he received the thanks of the Society.<sup>12</sup> In 1826 Timothy had been elected a Chairman of the Committee of Mechanics and he presided at meetings with great regularity down to 1830. His last recorded appearance at a meeting was on the 25th February, 1830.

Francis Bramah, of Pimlico, second son of Joseph Bramah, was elected on 1st May, 1816, and the two brothers attended some meetings together, but Francis does not appear in the list of members at any meeting after Timothy became Chairman of the Committee of Mechanics.

The third son of Joseph Bramah, Edward Henry, was elected a member of the Society on 15th March, 1843, his address being 6 Great Winchester Street, City. In the minutes of the Committee of Miscellaneous Matters for 31st January, 1844, it is reported that 'Mr. Bramah and Mr. Mair, members of the Society, being gentlemen likely to attend frequently if elected to the Committee, it was resolved that Mr. Edward Bramah be elected a member of this Committee'. On 14th February, 1844, Edward duly took his seat, and at the following meeting, on 21st February, great consternation was caused by the report of the sudden death of Miss Cockings, who had been Housekeeper to the Society for many years.<sup>13</sup> All the rooms in the basement were immediately sealed and a sub-committee was set up shortly afterwards to survey the whole building with a view to clearing the rubbish, models, etc. from the rooms and cellars. Edward Bramah was appointed to this sub-committee, and it was arranged that the minutes of the Society, which had been scattered through numerous books, should be sorted out and bound in thick volumes, in an inexpensive manner. In this way the record of Joseph Bramah's service to the Society owed its preservation to his son Edward. In April, 1844, Edward was elected Chairman of the Committee of Correspondence and Papers, and was involved in making arrangements for the presentation of prizes by Prince Albert on the 10th June, 1844. In April, 1845, he resigned from the Society.

Thus for over sixty years, from 1783 to 1845, Joseph Bramah and his sons were active members of the Society of Arts, contributing to, and equally benefiting from, the social intercourse and the technical discussion of the leaders in every branch of art and science in London during that remarkable period of political and technical revolution.

R. W. ALLOTT

1. R. E. Schofield, 'The Society of Arts and the Lunar Society of Birmingham (i)', *Journal*, Vol. CVII (1959), p. 512.

2. For the life of Joseph Bramah see J. Bramah, *Dissertation on the Construction of Locks* 2nd ed. (London, 1815); *New Monthly Magazine* (1815), p. 212; S. Smiles, *Industrial Biography* (London, 1863), pp. 183-97; J. Wilkinson, *Worthies of Barnsley* (London, 1883), pp. 225-57; J. Nasmyth, *Autobiography* (London, 1885), p. 205; H. W. Dickinson, 'Joseph Bramah and His Inventions', *Transactions of the Newcomen Society*, Vol. XXII (1941-2), pp. 169-86; R. W. Allott, 'Joseph Bramah', *Journal*, Vol. XCVII (1949), pp. 519-20. The author is collaborating with Mr. Ian McNeil in the preparation of what is hoped will be a definitive life of Joseph Bramah.

3. Patent Nos. 1177 (1778), 1402 (1783), 1430 (1784), 1478 (1785), 1720 (1790), 1948 (1793), 2045 (1795), 2196 (1797), 2232 (1798), 2560 (1801), 2652 (1802), 2840 (1805), 2977 (1806), 3260 (1809), 3270 (1809), 3611 (1812), 3616 (1812), 3780 (1814).

4. Unless otherwise stated, the information given in this article has been extracted from the MS. Minute Books of the Society and of the Society's Committees, and from the MS. Subscription Books of the Society. The Subscription Books record the election, annual payments and death or resignation of subscribing members.

5. Patent No. 1430. Bramah addressed a letter to the Society on the subject of locks. It was received on 26th November, 1783, and was referred to the Committee of Mechanics. Unfortunately it has not been preserved amongst the Society's Loose Archives.

6. The dates of Joseph Bramah's attendances at the Committee of Mechanics are as follows: 27th Nov., 4th and 18th Dec., 1783; 22nd and 29th Jan., 12th and 26th Feb., 10th and 15th March, 20th May, 11th and 25th Nov., 1784; 10th and 17th Feb., 3rd and 24th March, 1785; 18th Feb., 18th and 24th May, 9th and 30th Nov., 1786; 22nd Feb., 1st, 8th, 15th and 29th March, 19th April, 3rd May, 1787; 14th Feb., 1788; 12th Feb., 26th Nov., 1789; 4th and 18th March, 1790; 10th Feb., 5th May, 24th Nov., 1791; 29th March, 1792; 21st and 28th Feb., 10th April, 5th Dec., 1793; 17th Nov., 18th Dec., 1794; 5th March, 1795; 11th Feb., 1796; 23rd Feb., 27th April, 1797; 13th Dec., 1798; 22nd Jan., 14th Feb., 1801; 28th Nov., 1802; 3rd Feb., 1803; 10th Dec., 1807; 15th March, 1810; 14th Feb., 1811.

7. Patent No. 1948. The Bramah Fire Engine of 1791 is still preserved in the Public Library at Barnsley.

8. Patent No. 2652.

9. Patent Nos. 3270 and 3616.

10. *Transactions of the Society of Arts*, Vol. XXXIV (1816), p. 252.

11. *Ibid.*, pp. 250-70. Plate 30 of this volume of the *Transactions* contains the clearest illustration of the press, including the vital collar, which has so far come to light.

12. *Ibid.*, Vol. XLVII (1829), pp. 140-7; Vol. XLVIII (1831), pp. 84-91.

13. For the 'formidable' Ann Birch Cockings see D. Hudson and K. W. Luckhurst, *The Royal Society of Arts, 1754-1954* (London, 1954), p. 175.

## OBITUARY

### SIR AMBROSE HEAL

Sir Ambrose Heal, a former Albert Medallist of the Society, and a Member of the Faculty of Royal Designers for Industry, died on 15th November, aged 87.

*Mr. John Gloag, Hon. A.R.I.B.A., Hon. F.S.I.A., writes:*

Sir Ambrose Heal exerted a profound influence not only on the development of furniture during the opening decades of this century, but on the character of present-day design. He brought substance and commercial vitality to the arts and crafts movement; for although Eastlake and William Morris initiated that movement, Ambrose Heal gave it an intimate association with the life of ordinary people. An executant craftsman of a high order, his work was recognized early, and in the Paris Exhibition of 1900 he was awarded a silver medal for a bedroom suite. He had the incomparable advantage of working in a long-established family business, and although he designed and made fine individual pieces of furniture, he never became or desired to become an exclusive artist-craftsman: instead he was concerned with directing and encouraging the production of simple articles that could be bought by people with modest means, furniture that restored the colour and marking and texture of wood to their pre-Victorian place in design. Charles Eastlake in the 1860s had deplored the obliteration of wood with stains and polishes and the use of

meretricious ornament, and forty years later Heal's furniture demonstrated to thousands of people the rich and varied beauty of a material that had been mis-handled for over a century. The sensitive interest in the decorative properties of wood exhibited by so many of our contemporary furniture designers is largely derived from Heal's research work in industrial design, for he was one of our earliest and most effective industrial designers.

Although he became chairman of the family business in 1913 and remained in control of it for some forty years, he had many other active interests. His knowledge of the craft and history of cabinet-making was immense. His book on *The London Furniture Makers, 1660-1840*, a monument of erudition, was published in 1953. His earlier works included *London Tradesmen's Cards of the XVIIIth Century* (1925); *The English Writing-Masters and their Copy Books* (1931); *The English Goldsmiths, 1200-1800* (1935); and *The Signboards of Old London Shops* (1947). He was knighted in 1933, appointed a Royal Designer for Industry in 1939, and awarded the Society's Albert Medal in 1954 for his services to industrial design. Now the last candle lit by William Morris is out.

#### SIR ALBERT BRAITHWAITE

Major Sir Alfred Newby Braithwaite, D.S.O., M.C., for many years a Conservative Member of Parliament, died in London on 20th October, aged 66.

Braithwaite was born in Leeds, of which his father had been Lord Mayor, and where he attended the grammar school and the university. He had barely finished his education when, on the outbreak of the First World War, he enlisted as a private soldier. In 1915 he received a commission in the Yorkshire Hussars and was appointed to command a French Mortar Battalion in France. Two years later he became an instructor to the American Army, and later took part in the British Military Mission to the United States. Braithwaite was unsuccessful in his first Parliamentary candidature, but in 1926 he was elected to represent the Buckrose division of Yorkshire. He held this seat until the Conservative reverse in 1945. For six years thereafter he was absent from the house, and able to give more time to his numerous business interests. Then in 1951 he was returned for Harrow West, a seat which he held with an increased majority in the recent general election. He was a popular member of the Commons, and particularly respected for his work in promoting good relations between this country and the United States, and for his advocacy of Commonwealth development. It was as a result of Braithwaite's initiative and enthusiasm that a delegation from the United States Congress paid a highly successful visit to Parliament in 1945.

Braithwaite was knighted in 1945. He had been a Fellow of the Society since 1933.

#### NOTES ON BOOKS

A HISTORY OF SCIENCE: HELLENISTIC SCIENCE AND CULTURE IN THE LAST THREE CENTURIES B.C. By George Sarton. Cambridge, Massachusetts, Harvard University Press; London, Oxford University Press, 1959. 63s net

George Sarton, who died in 1956, was one of the outstanding historians of science of his time, perhaps of all time. When he retired from his professorship at Harvard, he undertook the task of embodying the substance of his teaching there in a monumental history of science running into eight or nine volumes. The first of these, dealing with the growth of ancient science to the end of the fourth century B.C., was published in England in 1953. The second volume, covering the last three centuries of the pre-Christian era, has now appeared. It was completed by the author just before his untimely death; and his successor at Harvard, Professor I. Bernard Cohen, has contributed a Foreword. It is planned to continue the series, bringing the story

down to the present time; but unfortunately no further instalments by Dr. Sarton will appear.

This volume, then, tells the story of how, following the political downfall of Greece, the ideals of Hellenic culture revived, with local admixtures, in the wider setting of the Middle East, giving rise to various types of so-called Hellenistic civilization.

Of the two parts into which the book is divided, the first is devoted to the third-century renaissance associated with the Alexandrian Museum and Library (where research was organized as never before) though manifested also in other centres. This was the golden age of Euclid and Apollonius, of Aristarchus and Aratus, of Archimedes and Eratosthenes, who all receive extended and imaginative comment together with their contemporaries, Herophilus and Erasistratus, who laboured in the fields of anatomy and medicine. Sarton loved the humanities no less than science; and he was careful not to neglect the philosophical, literary and artistic creations which balanced the more strictly scientific achievements. He was conscious too of the fog of superstition in which the Greek scientists worked and which made their accomplishment all the more astonishing.

The second part of the book covers the period of the decadence of Hellenistic civilization and the progressive eclipse of Alexandria by Rome. Here the social, philosophic and religious factors are of particular significance; and they are discussed at length by way of introduction to the later chapters dealing with the special sciences and disciplines. There are fewer great creative figures in this period; but Hipparchus stands out, both as mathematician and as astronomer, with Philo of Byzantium, Vitruvius, Lucretius and Virgil. Considerable space is devoted to the technological achievements of the age. These included the building of the Alexandrian lighthouse and of the great cities, roads, harbours and aqueducts, the construction of huge oar-driven galleys, the invention of the force pump, of the water organ and of other hydraulic devices, and the development of mining and metallurgical techniques.

Sarton knew how to infuse the lucidity and wit of his native French into the speech and writing of the English which he made his second language; and this last book of his, while a work of exact scholarship designed for serious students, is also a moving personal testament, an intellectual and spiritual experience shared with the receptive reader. His tendency to conceive science as an aesthetic adventure inspired by the love of rationality disposes him to minimize the significance of economic factors in motivating scientific research and in creating a society in which the scientist can operate.

The interest of the book is enhanced by the illustrations, which include many title-pages of the first printed editions of famous Hellenistic classics. The text is supported by an apparatus of notes, affording elaborate guidance for further study of the period.

A. ARMITAGE

A HANDBOOK OF GREEK ART. *By Gisela M. A. Richter. London, Phaidon Press, 1959.*  
37s 6d net

For long there has been need of a comprehensive, up-to-date, authoritative handbook to classical art. The 1946 Exhibition of Greek Art, arranged by Charles Seltman and Jacqueline Chittenden at Burlington House, London, demonstrated that a public existed which enjoyed Greek sculptures and pottery, not merely as adjuncts to historical or classical studies, but as works of art. During the last twelve years that public has steadily grown. Here then is a profusely illustrated book that meets the requirements of such an audience, and meets them handsomely.

Four hundred packed pages of text and five hundred pictures (four in colour), systematically arranged, unfold the story of Aegean art from its emergence out of the

clash of Minoan and Mycenaean cultures to its ultimate decline in beauty just before the beginnings of the Christian era. The coverage of the book is admirable: architecture, sculpture, gems and coins, jewellery, metalwares, pottery and glass, furniture and fabrics, paintings and mosaics, and finally ornament and epigraphy. And, as if these were not enough, Miss Richter has provided many pages of notes, excellent book lists, a tentative but extremely valuable chronology of Greek sculptures from 850 B.C. to 100 B.C., a glossary and indices.

The book is well balanced. Rightly, Miss Richter devotes more space to Greek sculpture and vase-painting than to other subjects, because in these we see the gradual unfolding of the Greek conception of the human figure, and of the technical devices and conventions by which sculptor and painter gave increased power to its representation. Moreover vase paintings taken in conjunction with surviving mural paintings and mosaics enable us to fill out our inadequate knowledge of large-scale Greek figural composition.

Miss Richter does not indulge in rhapsodies or fine writing. Whether describing the sequence of archaic carvings, the development of the Doric temple, or some rather recondite ceramic techniques, she is always economical of words and admirably lucid. Few will find much to criticize in this book. Here and there another opinion may be expressed. Is the Vatican Laokoon, for example, an original by Hagesandros, Polydoros and Athanodoros, or a marble *tour-de-force* by three virtuoso craftsmen after a lost bronze? The subject is surely one more suited to bronze than to marble, to the modelling technique rather than to stone carving. Again, the ceramic purist may query the use (more truly misuse) of the word 'glaze' in connection with Greek vase-painting. Incidentally, true pottery glazes were used by the Greeks and are described in the chapter on 'Glass and Glaze'.

The generous illustrations, taken from familiar and unfamiliar sources, are well-chosen. They not only aptly support the text but provide many visual pleasures. One would linger over them and try to re-create in the mind the world for which they were made and which made them. How serene and balanced these works seem beside the frenzied and distracting products of the twentieth century. Indeed they are the perfect expression of that ordered pattern implied in the quotation from Plotinus with which Miss Richter heads her beautiful book: 'What is it that attracts the eyes of those who behold a beautiful object, and calls them, lures them towards it, and fills them with joy at the sight? . . . Almost everyone declares that the symmetry of parts towards one another and towards the whole, with, besides, a certain charm of colour, constitutes the beauty recognized by the eye, that in visible things, as indeed in all else, universally, the beautiful thing is essentially symmetrical, patterned'.

At thirty-seven shillings and sixpence this splendid, well-printed, well-bound book is astonishing value. One may hope it is the first of a series, and that other handbooks will follow on Early Christian, Gothic, Renaissance and Baroque art.

REGINALD G. HAGGAR

A CONCISE HISTORY OF MODERN PAINTING. By Herbert Read. London, Thames & Hudson, 1959. 28s net

It is over a quarter of a century since *Art Now*, in Kauffer cover and Sans type, took its place as a central point of reference for a whole generation. More than any other single work between the wars, that book served to bring Britain into touch once more with the main stream of European art. Since then its author has several times been the target for the jeer that he has 'been in at the birth of every new movement and in at the death of none'. Though Sir Herbert, one may sometimes suspect, does not so much love art for its own sake as for its ability to stimulate new chains of ideas, to provide the raw material for a philosophy, an aesthetic, the last laugh is likely to be his.



As he comes, in his new book, to record the historical development of the movements whose persistent and persuasive advocate he has been, there are few which do not show obstinate life still—in some cases a vigour scarcely to be guessed at even ten years ago. His subject is not 'painting in our time' but those currents and movements in modern painting which together constitute an art completely distinguishable from that of other periods. The continued resilience and receptivity of Sir Herbert's critical approach, it should now be clear, arises not from inconstancy but from detachment, from this wider sense of modern art's collective break with the past and its underlying inter-relationships. To have accepted at any point the mutual exclusivity so often claimed for individual trends by more partisan protagonists would have been to deny history.

It is his dispassionate liberalism which has enabled Read to construct, in this volume, a framework for the period at once so comprehensive and concise, so authoritative and impeccably lucid (only in the case of Dali does he permit himself a note of severity). To establish such a pattern with sufficient clarity for it to be of use to the wider public must, in the nature of things, entail small falsifications and over-simplifications. It is the great merit of Sir Herbert's book that these are kept to a minimum.

His synthesis is constructed around the five 'great leaders' since Cézanne: Matisse, Picasso, Kandinsky, Mondrian and Pollock, while the two main streams of non-representational painting he labels 'an art of determined relations' and 'an art of inner necessity'. For some tastes, Sir Herbert may seem to give over much weight to expressionism in its various forms, as opposed to less *Angst*-ridden idioms. In so far as this bias serves to explain the origins of current anti-rational trends, however, it may be counted of value and it is a useful feature of the book that current American painting is made to take its place within the wider context. Towards the end the names crowd in at an increased, though still measured, pace—rather like a B.B.C. newsreader at the end of his Bulletin when pressed for time. I would wager that one or two of the British painters referred to will be totally unknown to the great majority of readers in this country. The years will doubtless thin the later pages dealing with work in progress, but that is not to detract from their present worth.

Well over 300 artists are represented in nearly 500 illustrations, 100 of them in colour and properly integrated with the text. Many of these are old friends, but many too are less familiar, and there is a commendable freshness about the choice as a whole. The book also includes some useful notes and an admirable short bibliography. It will clearly remain a standard work of its kind for a long time to come and at its price it is quite astonishing value.

MICHAEL MIDDLETON

POTTERY THROUGH THE AGES. By George Savage. Harmondsworth, Penguin Books, 1959. 7s 6d net

When George Savage produced his *Porcelain through the Ages* for the Pelican books some years ago, it was evident that the growing public for popular, authoritative works on ceramics would not be satisfied until he performed a similar service for pottery. This he has now done, and having made allowance for his marked predilection for porcelain, it can be said that the present volume is worthy of its predecessor.

To deal with the earthenwares and stonewares of Europe and the Near and Far East in 229 pages of text is a remarkable feat, though the need for compression bears heavily on the author. In his anxiety to achieve brevity he is in danger of creating a wrong impression as, for instance, when he refers to *black* figures on Greek funerary *lekythoi*. His illustrations, mostly from English collections, are well chosen; no fewer than 111 specimens, excellently produced on 64 plates, give an indication of the value of the book.



Mr. Savage ranges from the rarities seen only in museums to many types of pottery which are still passing, in ever-decreasing numbers, through the auction rooms and the antique shops. Few readers will cavil at his omission of primitive pottery but, having devoted a pregnant chapter to Egypt and Mesopotamia, one cannot but regret the absence of any mention of the equally important Amerindian wares.

The ancient pottery of Greece, Rome, Byzantium, China and the Far East are discussed in two chapters, which are a model of concise scholarship. The incomparable Islamic wares of the Near and Middle East are described with sympathy and understanding. Europe is treated in seven chapters which review the important wares of the Continent with astonishing detail in so small a book.

Admirable accounts of all the principal productions of Europe are given, country by country, and in addition to sound historical data, Mr. Savage supplies much valuable information on styles and influences. Only when he turns to English pottery is he less than generous. His attitude, indicated by his somewhat tart reference to the need for 'mercy rather than justice' in assessing the merits of English wares, may account for several mistakes. Bernard Moore did not use flambé glazes on a stoneware body, nor is the theory of the connection of the potters Toft with Leek any longer tenable. Enoch Wood's well-known plaque the 'Descent from the Cross' was copied from a painting by Jean Jouvenet of Rouen and not, as stated, from the immeasurably greater work by Rubens.

These are mere trivia, however, and do not detract from the excellence of a work which will prove an invaluable companion to the author's *Porcelain through the Ages*.

GEOFFREY BEMROSE

THE CARVER'S COMPANION. By Peter Morton. London, A. & C. Black Ltd., 1958.  
30s net

The older artists among us remember a time when the 'how-to-do-it' book seemed fundamentally of small value or importance. Formerly it could be claimed with considerable justice that it had only the minor function of introducing to a few people, compelled to live in remote places, things which could be taught far more efficiently and thoroughly by methods based on demonstration; while, at the same time, schools for teaching these basic skills of the visual arts by demonstration methods were amply provided in centres of civilization. However, present trends have produced a situation in which books like Mr. Morton's *Carver's Companion* have acquired an unforeseen kind of function and importance. A situation presses upon us in which the art students of to-day have no wish to acquire those basic skills which were an essential condition of being able to produce works of art of the traditional and figurative kind. It is an inescapable fact that, want them or not, these skills can only be acquired slowly by patient study. The art students of to-day have no choice in the matter. The situation in which they find themselves allows no time for such things and the main schools of art no longer provide instruction in them, nor do they even make the students aware of their former existence. This makes it so that the eventual placing of Mr. Morton's *Carver's Companion* in the vaults of the Library of the British Museum is parallel with the placing of to-day's newspaper and a selection of coins in a casket under the foundation stone of some new building. I think it is extremely important that in, say, 1980 there should still be preserved a record of the sort of things Mr. Morton and some other present-day survivors still understand from the practising rather than historical angle. Although Mr. Morton gives the impression here and there of scarcely being able to sustain such a hope, I myself think it is even highly probable that in the future a few individual works of art of the traditional kind, which also means figurative, will still be called for. There will by then be no other way of finding out how to do it but from books like this.

I can recommend the book most wholeheartedly to architects and other potential

clients of the carver. It should increase their enthusiasm and give them the knowledge they need to choose a good carver and employ him to the best advantage. I will sound only one note of adverse criticism. I do not feel that in the book Mr. Morton reveals the knowledge I know he possesses in quite a sufficiently detailed and thorough fashion to fulfil the implication of the title—that is to say, to enable the young artist of 1980, landed with a commission for a traditional and figurative type of carving, and there being then no school in which he could learn how to do it, to prop up the *Carver's Companion* behind bench or banker and from it find out how to do the job. I think, maybe, Mr. Morton has tried to cover a wider field than the format could accommodate.

MARK BATTEN

THE WORLD'S LIGHTHOUSES BEFORE 1820. By D. Alan Stevenson. London, Oxford University Press, 1959. 63s net

The reviewer, having attempted the impossible in trying to compress the history of lighthouses from the earliest times to the present into 18 pages of his own book, can hardly dare to examine for omissions or lack of balance a work in which over 300 large pages brings us only to 1820. Moreover the author disarms us at once by freely confessing that a somewhat disproportionate attention to British lights is not only due to their latterly outstanding developments but also to the fact that they have been much better documented than others.

We must therefore examine the work from the point of view 'is it readable?' and the answer is quite definitely 'yes'. It is a somewhat disjointed story, but of compelling interest, and Mr. Stevenson has handled it well, although a little more on the navigational customs in the ages during which lighthouse aids developed might have been welcome. On the question of accuracy, I have known Mr. Stevenson for some years as a most painstaking researcher and he comes from a family that has worked for more than a century and a half in the lighthouse field. He is directly descended from the Robert Stevenson who, as engineer to the Northern Lighthouses, made three remarkably well-documented tours of British lights in 1801-18. Another Stevenson (Alan) in 1850, published a *Rudimentary Treatise on the History, Construction and Illumination of Lighthouses* (John Weale, London) in which he by no means let down the reputation of his predecessor as engineer to the Northern Lighthouses. The family's tradition of authorship extends to the present author's uncle, who was none other than 'R.L.S.'

The mass of illustrations in this work taps many sources previously unknown to the reviewer. Unfortunately most of them continue to remain unknown, as there is little information about the original sources. This might also be said of much of the text, and were it not for confidence in Mr. Stevenson as a historian, might be serious. It is, of course, almost a corollary now to modern printing and publishing costs that the author has to omit either source material or facts. The indices seem very helpfully arranged and Section XVI, in smaller type, on illuminants and optical apparatus, is a most welcome feature.

It is quite impossible to write about lighthouses without getting involved in the dramatic. Even the aftermath of that dramatic achievement, the erection of the Bell Rock light, was a bitter dispute between the families of Rennie and Stevenson as to who had designed and built it. This forms another appendix to the book which, to anyone familiar with the virulence with which the original quarrel was prosecuted, is a most balanced account. The author must be allowed his five pages, which are quite illuminating.

When ancient lights are considered Mr. Stevenson takes nothing for granted and adds his own perceptive comments on some of the conjectures of earlier writers. There must always be a certain amount of interpretation in the acceptance or otherwise of early sketches and records, many of which fail to agree with each other. For

instance, Mr. Stevenson prints a view of Genoa in 1650, unknown to me, which differs considerably from *l'image de Gênes*, painted by Grassi in 1597 from a previous work of 1481. In half a century the towers of both 'lanternae' have become squatter, but we know from what we can see to-day that the earlier picture (not illustrated by Mr. Stevenson) is the more accurate. It is therefore an admirable feature of Mr. Stevenson's book that he gives us a multiplicity of representations of most of the early lights and lets us take our choice as to which is the more likely after reading his own penetrating observations on their features. Many of those taken from early maps are obviously more conventional than accurate.

On page 130 Mr. Stevenson recounts a macabre story of a lighthouse keeper who, some time before 1801, kept the dead body of his mate for weeks at the storm-bound Smalls light lest he should be accused of murder if he threw it in the sea. Smeaton tells the same story of Rudyerd's Eddystone Light, which was destroyed by fire in 1755, and even adds revolting details of the stench which pervaded the structure. There are divergences enough to suggest that both incidents may well have happened: In fact, lighthouses and events connected with them are so much outside normal experience that it would be almost impossible to make a dull book about them. Mr. Stevenson, without indulging in journalistic tricks that mar so many present-day volumes on dramatic subjects, has compiled a very readable reference book which should remain a standard work for many years to come.

W. T. O'DEA

ADVERTISING IN MODERN LIFE. By John Gloag. London, Heinemann, 1959. 10s 6d net

The belief that advertising is just a racket seems still to be very commonly held. Attacks on advertising come from almost every quarter, and for an astonishing variety of reasons—though fervour rather than reason is usually the more evident attribute of the attackers.

The root causes of this distrust of advertising make interesting material for speculation. Many people still fall for the economic argument that, because advertising costs money, it must inevitably raise the price of goods—a fallacy which was exposed by experience long ago. Other people like to pretend—and perhaps honestly believe—that advertisements never influence them, and must therefore be waste of money. This proposition is difficult to disprove in individual cases, but thousands of successful campaigns bear witness to its general untruth. A fear that advertising debases taste and works evil on unformed minds needs to be taken more seriously. Some of the less responsible practices lend substance to the complaint, but rigorous action is taken within the profession to control the standards and to reduce the danger. As in other walks of life, there are occasional transgressors and, by the nature of their work, their transgressions are unfortunately displayed for all to see. It is perhaps this fact more than any other that has earned a bad name for advertising.

Although *Advertising in Modern Life*, Mr. Gloag's fiftieth published book, is designed to throw light on the subject for the general reader, the author wastes no time in speculating why advertising needs an *apologia*. No doubt believing that attack is the best means of defence, he sets out in forthright style to explain the function of advertising, its essential place in an industrial community, and how advertising agencies are organized to perform their part. He also briefly describes the development of tradesmen's signs, songs, cards, and other devices which were the forerunners of the highly technical and specialized methods employed to-day.

Mr. Gloag is well known to readers of this *Journal* for his many years' service on the Council of the R.S.A. As a director of a large London agency with long experience of the business, he is certainly fully qualified to write about advertising. He will convince some doubting readers that advertising is not so black as many paint it, but he will probably not convince them all. There are too many bald assertions

unsupported by evidence to make his book really persuasive—a case, perhaps, of an advertising technique misused!

In its descriptions of how advertising works, the book lacks practical examples. These would have made the chapters devoted to the various agency departments more instructive, and probably more entertaining. Advertising is a colourful, an imaginative and even an exciting occupation; it should have made a book which reflected something of these qualities.

G. P. GRIGGS

### SHORT NOTES ON OTHER BOOKS

PHOTOGRAPHIC PROCESSING. By *John Blaxland*. London, George Newnes, 1958. 18s net

A guide to the correct handling of sensitive photographic materials and chemicals during processing. The information given is essentially practical, all theory having been purposely omitted.

NEW ZEALAND IN THE MAKING. *A Study of Economic and Social Development*. By *J. B. Condliffe*. London, Allen & Unwin, 1958. 30s net

A completely revised edition of the work first published in 1930 which tells how, after exploring many avenues, the New Zealand settlers finally discovered that their economic prosperity lay in sheep-farming and dairying. On many historic developments, especially the economic development of the Maori people, the story is carried up to the present day. The statistical material used is now carried to 1935, and subsequent material is treated in the author's sequel, *The Welfare State in New Zealand* (reviewed in the November *Journal*, p. 873).

### FROM THE JOURNAL OF 1859

VOLUME VIII. 16th December

THE AGRICULTURAL LABOURER

SIR,—I had the pleasure of listening to the paper read by Mr. Morton on Wednesday evening last, on 'The Forces used in Agriculture' . . . I was pleased, in the discussion which followed, to hear Professor John Wilson draw attention to an important point in the consideration of the question, namely, the necessity of paying as much attention to the condition of the labourer as to the steam-engine, or to the horse, in order to make him a proportionally economical and efficient 'medium' through which force can be communicated. Now while we, as a general rule, endeavour to develop to the utmost the efficiencies of our steam-engines and horses, it is painfully notorious that we do comparatively little in this way so far as our labourers are concerned. The 'British labourer', says some one, 'is the best living tool in the world' . . . We have for a long time—how long, let the weary annals of wrong and wretchedness in our own national and social history tell—acted towards him as if, to use the graphic expression of Mr. Sidney, he was some 'noxious weed', of which the sooner we were rid the better. We have sadly underpaid him; we have forced him—for that is precisely the truthful expression—to grovel out a species of living death in huts and hovels, where the maintenance not only of physical, but mental and moral health, was simply an impossibility; we have done all this in the way of wrong, and have omitted to do much in the way of right, towards our labourers in field and farmyard; and we are finding—nay have already found—to our own cost, that he is not so efficient a workman as our necessities and daily growing wants require him

to be; and, now that other channels of occupation are being opened up to him, that he is fleeing whenever opportunity offers from the rural district, as one does from a doomed city. . . . The maintenance of efficient 'working' men depends upon provisions of two kinds being secured, the provisions for the body and for the mind; and, so far as the first is concerned, let it not be supposed that all that is included is what is generally meant by the term, namely, meat or victuals. . . . Provision for the body in the sense we—in common with many who are instructed on this subject—mean it, involves, amongst other things, arrangements by which every attention can be paid to the development of the health and strength of the labourer—and this to be secured by well arranged and healthy houses. The question of the first of these points, namely, improved cottages or houses, is, indeed, one of the most important with which agriculturists can concern themselves, underlying as it does, and greatly influencing, many points connected with the pecuniary position of agriculture. There can be little question but that, just as sure as it is a losing concern to put valuable animals, as horses or cows, into badly-arranged and ill-ventilated apartments, where disease most readily takes hold of them, and quickly does its work, it is as surely a losing concern, where the labourer is placed in circumstances where his physical strength is sapped out of him, where disease is easily engendered and unrestrained in virulence . . . the healthier and stronger a labourer is, the more likely is he to become of paying service to his master. . . .

But the advantages derivable from the securing of good and healthy cottage accommodation are not simply of a physical kind. They have a close connection with the 'provision' for the mind or intellectual power. Certain it is, that if we simply provide for outdoor or school education, and take no care for the education of the home, or the influence of the lessons given daily around its hearth, we run a great risk that much of the efficiency and soundness of the outdoor education will be lost. Now the quiet order, the decent observances, and the sound morality which best dignify the family hearth, cannot be observed in hovels where all the arrangements are subversive of decency: and antagonistic to all regularity and order. It is for this reason, and justly, that those who have well studied the matter in all its bearings, insist upon the necessity of good cottage accommodation being provided in the first place; that this, in fact, must precede or at least proceed *pari passu* with, all other movements having for their object the raising of the standard, physical and mental, of the agricultural labourer. Intellectual and moral elevation cannot result with certainty from any plan of aggressive educational operations, however well and persistently carried out, when at their homes and around their hearths everything nearly is calculated to degrade. . . .

I have no sympathy with that class of philanthropic sentimentalists who are perpetually expecting us to do all for the labourer, and who think, or seem to think, that he should do nothing for himself. The labourer . . . has his duties to perform, not less to his master than to himself . . . He is bound to do his best to maintain himself by the exercise of habits of sobriety and well-doing, habits over which the master can possibly have no control, in good working order; but, at the same time, the master is equally bound to do all he can to aid the labourer in the maintenance of this efficiency, and not to place him under circumstances in which neither health of body nor purity of mind can be maintained. The question, I repeat, of improved cottage accommodation is one which must be worked out fully and completely by the master and landlord. Under the present system there is and can be no other alternative. Apologizing for the length to which my remarks have reached, my only excuse for which is the importance of the subject,

I am, &c.,

ROBERT SCOTT BURN

December 10th, 1859.

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## Some Activities of Other Societies and Organizations

## MEETINGS

- MON. 30 NOV. Royal Geographical Society, 1 Kensington Gore, S.W.7. 8.30 p.m. Professor C. von Filler-Haimendorf: *Sherpas of eastern Nepal*.
- WED. 2 DEC. Engineering Designers, Institution of, Queen's Hotel, Birmingham. 7 p.m. H. Haith: *Diesel engine design problems*. C. Green: *The manufacture and design of cold rolled sections*.
- Newcomen Society, at the Science Museum. 5.30 p.m. O. F. G. Hogg: *The development of engineering at the Royal Arsenal*.
- Victoria & Albert Museum, S. Kensington, S.W.7. 6.15 p.m. Sir John Rothenstein: *Is abstract art an aberration?*
- THURS. 3 DEC. Plant Engineers, Institution of, at the Royal Institution, 21 Albemarle Street, W.1. 7 p.m. H. A. Thomas: *An introduction to electronic data processing*.
- FRI. 4 DEC. London Society, at the Royal Society of Arts, John Adam Street, W.C.2. 5.30 p.m. R. S. R. Fitter: *Nature conservation in the London area*.
- SAT. 5 DEC. Analytical Chemistry, The Society for, at the City Laboratories, Mount Pleasant, Liverpool, 3. 2.15 p.m. B. W. E. Minifie: *The analysis of cocoa and chocolate in relation to modern manufacturing methods*.
- Horniman Museum, London Road, Forest Hill, S.E.23. 3.30 p.m. Charles Bawden: *Outer Mongolia to-day* (with film).
- TUES. 8 DEC. Architects, Royal Institute of British, 66 Portland Place, W.1. 6 p.m. Professor Sir William Holford: *Brasilia*.
- Civil Engineers, Institution of, Great George Street, S.W.1. 5.30 p.m. H. C. Bowen and W. E. Foster: *Some post-war works of the Thames Conservancy*.
- Mechanical Engineers, Institution of, 1 Birdcage Walk, S.W.1. 6 p.m. A. E. W. Austen: *Some investigations into cold starting phenomena in high-speed diesel engines*.
- WED. 9 DEC. Analytical Chemistry, The Society for, at Burlington House, Piccadilly, W.1. 7 p.m. A. S. Curry, H. J. Walls and S. S. Kind: *Compendium: Biological methods in forensic science*.
- Royal Archaeological Institute of Great Britain and Ireland, at the Society of Antiquaries, Burlington House, Piccadilly, W.1. 5 p.m. Lawrence Wright: *The history of the bathroom*.
- FRI. 11 DEC. Engineers, Junior Institute of, Pepys House, 14 Rochester Row, Westminster, S.W.1. 7.30 p.m. J. M. Kay: *The engineer's rôle in nuclear power*.
- MON. 14 DEC. Transport, Institute of, at the Jarvis Hall, 66 Portland Place, W.1. 5.45 p.m. Henry Spurrier: *Government and roads and road Transport*.
- TUES. 15 DEC. Electrical Engineers, Institution of, Savoy Place, W.C.2. 5.30 p.m. Discussion: *Data handling problems in atomic installations*.
- Locomotive Engineers, Institution of, 1 Birdcage Walk, S.W.1. 5.30 p.m. W. L. Topham: *Methods of reducing flange wear on diesel and electric bogie locomotives*.
- Naval Architects, Institution of, at Institute of Marine Engineers, 76 Mark Lane, E.C.3. 5.30 p.m. K. Maddocks: *Some aspects of marine reactor security*.
- WED. 16 DEC. Foundrymen, Institute of British, at the Constitutional Club, Northumberland Avenue, W.C.2. 7.30 p.m. J. Vickers: *Aluminium castings*.

